

DECEMBER
1953

for men who manage
**chemical
processing**

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part of this month's "Proc-
essing and Engineering Data"

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American Cyanamid's K. C. TOWE
PIONEER of PROGRESS — in Plastics
(See Melamine article, page 6)

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"That's Interesting"

Odoriferous shapes

Someone has put a scientific nose into the question of "why smells smell" and come up with a possible answer. Although more research has to be done, the idea is this: some scientists hold the "site filling theory" of odor identification. According to this theory, the shape of the mole-



"A rose by any other name . . ."

cules coming into the nose cavity governs whether they will settle on one receptor "site" or another, stimulate one nerve or another, and thus inform the brain "rose" or "skunk".

If this is true, the proof, according to the report, is to change the shape of a particular molecule by sticking something on it, thus interfering with its fitting on a "site". Tests show it might work, but more has to be done. So—"A rose by any other name may NOT smell the same."

Hormones from radiators?

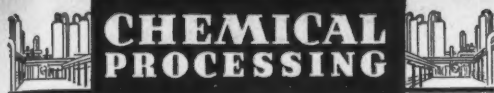
Reports have it that the Mexican sisal plant—source of sisal hemp for cords, twine, and lariats—is a rich storehouse of chemicals that can be converted quickly and cheaply into cortisone, and synthetic versions of other natural-occurring hormones.

Cortisone source material, called hecogenin, is found in the sisal plant's juice—a brown, soupy liquid that has a limited market in the US as an automobile radiator cleaner.

Brains on film

Announcement has been made that a 16mm color-sound motion picture ("Piercing the Unknown") is available. Film traces development of computing devices up through the IBM Electronic Data Processing Machines, IBM's latest "giant brain." The 22 min film may be booked through any IBM branch office, or by writing, stating dates, to Dept. of Education, International Business Machines Corp., Dept. CP, Endicott, N.Y.

When inquiring check CP 5120 on handy form, pgs. 2-3



(CHEMICAL PROCESSING PREVIEW)

For MEN WHO MANAGE

Vol. 16

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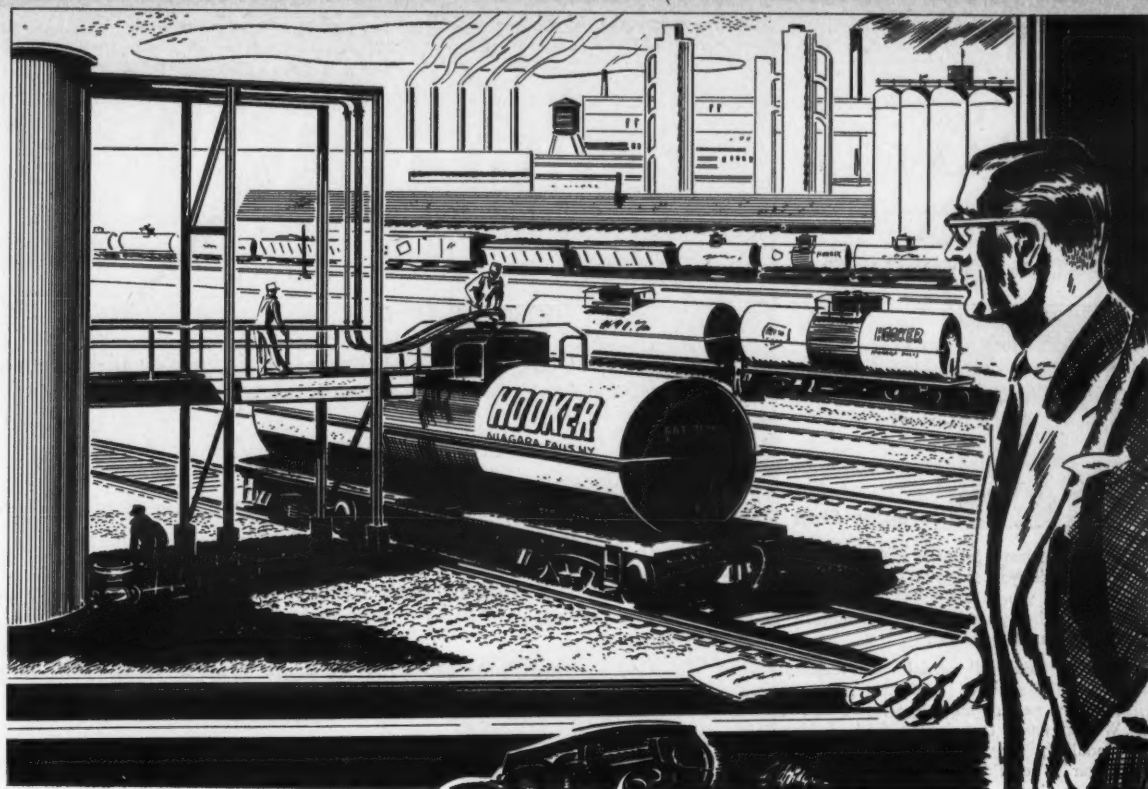
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In this Issue



Step by Step

Those automatic factories and processing plants will be delayed for some time yet, reports a man who should know. Technically feasible, he says, but probably not economically practical for most products.

Putting aside all social and technological aspects of such a "revolution", we wonder just how near or far in the future that day is. We do know that in the field of Materials Handling, for instance, increased mechanization is continuing to play its important role in "moving the goods." Step by step and with some momentum we are relegating more and more back-breaking jobs of moving materials to "giants" of steel and iron, whose every movements are determined by a press of a button or a flick of a finger. These machines and devices work with such precision that it becomes increasingly hard to tell just where mechanization stops and automation begins — particularly in smaller operations.

When we read that one man, seated at a control board, now accomplishes as much as six or eight men formerly required in a given time, we sense that the time may be shorter than we think. This sort of thing happens each day, and eventually we'll find we've been in the midst of the automation "forest" all along.

In the meantime, our progress continues. We've discovered that one electric motor running a conveyor costs as little as four cents or less per horsepower hour; sheet brawn for the same efforts costs as much as ten dollars. With such tremendous strides being realized, can automation be far behind?

Karl Beliakoff

ASSISTANT EDITOR

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3. If you want to subscribe to this magazine, see reader-qualification form opposite page 3

Management's Function in the Safety Program

G. W. E. NICHOLSON, Executive Vice President,
Union Bag & Paper Corporation



A graduate chemical engineer from Chalmers Institute of Technology, Gothenburg, Sweden, Mr. Nicholson had early experience as engineer and superintendent in various pulp and paper mills in Sweden, Canada, and the United States. During the decade, 1931 to 1941, he was manager of various plants of the Southern Kraft Div. of International Paper Co. Since joining Union Bag & Paper Corp. in 1941,

he has successively been Resident Manager in Savannah, Ga., Vice President in Charge of Manufacture, and Executive Vice President.

Mr. Nicholson's many memberships include: Engineering Institute of Canada; Technical Section, Canadian Pulp and Paper Industry; Technical Association of American Pulp and Paper Industry (former president); honorary life member of the Technical Association of the Swedish Pulp and Paper Industry; Swedish Academy of Engineering Science.

The industrial accident situation daily presents a social as well as an economic problem of greatest importance. It has, therefore, become a duty for everybody concerned to see that every industrial plant becomes a safer place in which to work, in the same manner as time and effort are given to improvement of production and quality of the finished product. A good safety record is a goal that the management of every industrial organization must strive for. Such a record is an expression of competent and enlightened management of modern times.

Effort to bring this about is closely interwoven with various methods required to achieve a wholesome and sincere relationship between management and workers in American industry. Top management must actively participate in the formation of a safety program and it must give encouragement as well as active help in order to create enthusiasm, especially when the going is at its worst. On the basic principle of mutual confidence and respect, safety and safe working conditions become a cooperative endeavor of management and workers. Great progress has been made, but we still have a long way to go.

Since a vast majority of industrial accidents, as shown by statistics, are caused by man-failure, it becomes evident that the problem of bringing about a good safety record depends mainly upon keen and alert leadership and supervision. This is where we recognize the need for capable and competent foremen who will understand and realize the importance of safe working habits. For this reason, the training of men is one field where we can accomplish the most by giving time, expense, and ingenuity.

There are two phases of training, one of the supervisors and the other of the workers. Supervisor safety-training is an important part of the overall foremen training that is so much needed today. A training program must be organized in such a manner that it maintains the supervisor's interest. He

(Continued on page 184)

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From recent literature

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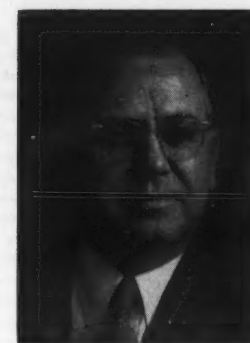
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PIONEERS OF PROGRESS

Wood, stone, and skin — these once constituted the material resources of man. From that remote time we have included glass, metals and other materials. In this chemical century we employ plastics. Here is how American Cyanamid Company, through the teamwork of its scientists, production men and engineers, and its sales and service staff brought a new, surprisingly useful material into the list. . .



K. C. TOWE

MELAMINE: A Jack of All Trades

School children, fighter pilots, hospital patients, the couple at the drug store counter, and Mr. & Mrs. Suburbanite may all be using melamine resins at the same time. For school children it means an almost steel-tough desk top which looks like fine, light wood . . . and which doesn't yield to initial-cutting pen knives. It's used in the ignition system and structure of fighter planes. The hospital, drug store, and suburban home may all have melamine dishes . . . and it's used in orthopedic casts, the drug store counter, and innumerable places in the modern home.

Yet this plastic material is just 16 years old as a commercial product. It was 1937 when Cyanamid began selling it to the Formica Company for decorative laminates, 1939 when it became a plastic material in its own right.

Says Cyanamid President K. C. Towe, "I'm sure that even the most optimistic of those men who worked on the early development of melamine could not have contemplated the eventual scope of usefulness the material would achieve, nor the rapidity with which it would take place."

The Beginning: One Man's Leading Role

Melamine plastics did not come into being via the Hollywood process of a brilliant, but accidental, discovery. As a matter of fact, like many organic chemicals of importance, melamine was first synthesized by a good German chemist.

Melamine had all the earmarks of a laboratory curiosity until 99 years after its first synthesis by Justus Von Liebig. But in 1933, Palmer Griffith, one of the "optimistic men," rediscovered it. Eleven years before that Mr. Griffith, fresh from a Master's degree at MIT, had started working for Cyanamid. This earlier work was concerned with new uses for cyan-

amide; and in the course of it Griffith made the discovery that melamine was an impurity in one of the cyanamide intermediates.

In 1928 the Cyanamid Company acquired American rights for producing a urea-formaldehyde resin. Griffith had a hand in improving this material. In this search for a better plastic he remembered melamine and still later, in 1933, began work on making this better plastic from melamine.

Though an impurity in an abundant product, the amine was not easy to procure. His first test batch of it was purchased from Eastman Kodak Company, which happened to have synthesized a small amount of it. He bought 100 grams at a price equivalent to \$40 a pound. The first ten grams of that batch provided the first answer. Melamine would condense with formaldehyde on a lab scale to form a resin.

A second small batch made the first melamine molding powder. Mixed with dried and ground paper pulp, it molded into perfect pin trays. And it was found that it gained only 0.5 per cent of moisture in boiling water; urea molding compounds picked up six times that much.

In the next year, the help of Dr. L. J. Cristmann, now Director of the Basic Nitrogen Division of the Stamford Research Laboratories, was enlisted in order to find a way of making melamine available for initial commercial production of resins. It was discovered that by heating the aforementioned intermediate (it was dicyandiamide), melamine could be produced.

With this accomplished, Griffith began to push for commercial production of melamine and melamine resins. As a research man turned salesman, he described, explained and persuaded everyone he could contact. His friend and business associate C. J.

Romieux joined enthusiastically in trying to build interest in the new material. But 1934 was just not the year that fate had chosen. Griffith was moved to new work on wetting agents and resins for the textile industry in 1935 and did not get back to melamine-formaldehyde for two years.

But in those two years, something important happened... the growing plastics industry developed a need for such a new material. And in 1937 a real chance came along. The Formica Company in Cincinnati had an expanding market for decorative laminates. They needed a colorless surfacing resin with better resistance to water, heat, chemicals and abrasion... which at the same time offered a maximum of production efficiency.

Palmer Griffith arrived in Cincinnati with a small amount of melamine resin and a conviction. After a few demonstrations his conviction was shared — Formica bought every pound of melamine that Cyanamid could make for more than a year after that. Now melamine goes each year into more than 100 million square feet of laminate — enough to cover the acreage of 7 or 8 medium-size farms.

The Rest of The Story: A Profusion of Talent

With commercial acceptance of the new plastic, Cyanamid men began rolling up their shirt sleeves immediately. Two major fields of work were tackled: first, production methods for melamine itself; second, development of new melamine products. Melamine advantages were indisputable, but even this first-rate material had to be able to complete with other plastics volume and price-wise.

Late in the 30's, the Ciba Company had worked out a high-pressure antoclave process for melamine production. Cyanamid obtained US rights to this Swiss process, but found there was still a lot of work between it and a commercially feasible method. Beside the usual high-pressure difficulties the Ciba process called for the use of anhydrous ammonia and produced a corrosive mixture in the antoclave. Even the finished melamine had to be kept under pressure. And since it was insoluble in most solvents it had to be handled as a slurry under pressure.

Dr. R. C. Swain (now Cyanamid's Research Vice-president) and Dr. J. H. Paden, however, licked these problems and more. They brought the material through successful pilot plant production.

Process problems, in fact, were solved in remarkably short order. In 1940, the company was able to build a plant at Bound Brook. Here, Dr. Victor L. King and Mr. A. C. Wintringham contributed to the perfection of the commercial process.

Today, most of the company's melamine production takes place at a plant in Willow Island, West Virginia, built shortly after World War II. This newer plant uses essentially the same process as the original Bound Brook plant.

Another plant for molding compounds and resin production was called into being by the war. It was built at Wallingford, Connecticut.

P. B. Watson, who had headed up plastics operations at Bound Brook, was the man chosen to get the Wallingford plant in operation. Shipments began in 1941,

(Continued on page 186)

New Uses for Polyamide Resins ★★★★★ New Source of Fatty Amines ★★★★★ Full Line of Fatty Acids

DOES ANYBODY KNOW what Polyamide resins can't be used for? General Mills chemists are frankly astonished at the mushrooming potential of Polyamide Resins. Latest development is a Polyamide-Epoxy resin mixture with unique properties.



Coating paper in the lab with Polyamide-Epoxy Resin

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Though both components are thermoplastic, the blends emerge as thermosetting compositions with a wide range of applications.

By varying the ratio of Polyamide to Epoxy resin, the resultant products may be either rubbery and resilient, hard and tough, or solid so they can be sawed, drilled, or turned on a lathe.

The cured blends also have excellent resistance to alkalis, common household chemicals, carbon tetrachloride, water, alcohol, gasoline, oil and many other finish-destroying chemicals. They are non-volatile, non-flammable, and give a flexibility of use no other resin has been able to match.

If you would like to try Polyamide Resin for your own use, just fill in and mail the coupon below.

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Top view of flotation units shows skimming blades on endless chain, and clear water effluent from risers tank which holds dissolved-air feed for one unit. Retention is at right of brick pumphouse which also contains control panels, in back of flotation unit

DISSOLVED-AIR FLOTATION

Removes Grease and Fats from Lever Brothers' Process Waste Water

Tiny air bubbles occlude particles as they rise, thereby cleaning up water before discharge to lake; system recovers bonus of 400 lb grease/day

PROBLEM: The Hammond, Ind., plant of Lever Brothers Company discharges about 2600 gpm of process waste water, most of which is cooling water from the barometric condensers of steam jet vacuum equipment on edible oil deodorizers and fatty acid stills. Oxygen in this water is somewhat depleted, and it is contaminated with free fats, oils, fatty acids, lime, and magnesium soaps.

Prior plant practice was to put this water through a gravity catch basin, or skimming basin, which removed most of the suspended solids, and then run the partially clarified water to nearby Wolf Lake.

However, it became evident that the basin couldn't handle the flow . . . greasy deposits continued to build up on the lake shoreline, and odorous gas evolution, due to decomposition on the lake bottom, increased.

Since the community planned to build up the Lake area as a recreation spot, this condition was particularly bad, and Lever officials agreed that something must be done to minimize the contaminants going to the lake. So a study of the possible methods of solution was started.

Solution: In the fall of 1951, two dissolved-air flotation units, called Colloidair Separators, were placed into operation, after several months of pilot plant runs with a small model. The units, each rated at 1500 gpm, operate in parallel on the partially clarified water from the skimming basin. Each is fed by its own pumping and air injection system, and has its own control network and retention tank. Basin effluent is held sufficiently long to insure proper dissolution of the finely dispersed air before it is re-

*new solutions
of processing problems*



Release of dissolved oxygen shows up as effervescence as liquid flows from inlet chamber (right), over wier, and into flotation chamber of Colloidair. Skimming blade slowly moves floating solids to sludge compartment at other end of machine

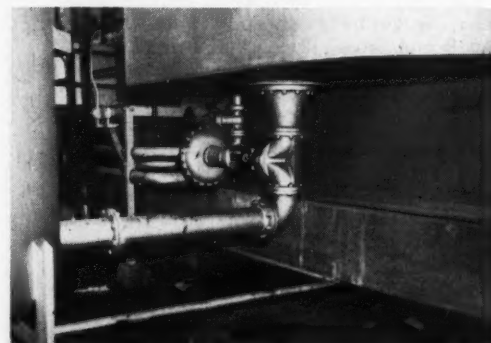


Close-up of clear water leaving riser from outlet on bottom of flotation chamber

leased in the flotation chamber. Depending on waste load, one or both of the machines will operate, as determined by float controls on the pumps.

A measured quantity of air is injected into the Colloidair feed by means of a unique air injector system attached to the pump suction. The water with its air enters the retention tank under a pressure of about 30 psig, and most of the air is dissolved in the water. That which doesn't dissolve under this pressure is bled off continuously from tank's top.

Water and dissolved air leave the tank through an automatic pressure-regulating valve, which obtains its signal from a pressure controller. The water then enters the bottom of the flotation unit's inlet chamber through a nozzle and around a circular diffusion plate directly above it, and overflows a wier into the flotation chamber. With this design, water is delivered to the flotation chamber causing only slight turbulence.



Pressure-regulating valve between retention tank and bottom of Colloidair inlet chamber holds 30 psig in tank

The reduced pressure on the water as it passes through the pressure-regulating valve and enters the inlet chamber of the Colloidair, causes the dissolved air to be released as a myriad of minute bubbles. As these rise to the surface, they float the suspensoids by occlusion. Skimming blades, on an endless chain, slowly sweep the aerated skimmings to the far end of the machine, at which point they are swept over a ramp and into a collection chamber. This chamber is periodically pumped out to a storage tank, from which the recovered sludge is returned to reacidulation in the plant.

Clarified water is removed through parallel outlet tubes on the bottom of the flotation chamber, at right angles to the line of flow. Each tube is connected to a riser on the outside of the flotation chamber. The 12 clarified water outlet tubes in each unit discharge into a clarified water chamber which is the same length as the flotation chamber. Each riser has an adjustable sleeve at the top so that liquid level in the flotation chamber can be regulated. Clarified water flows by gravity from the clarified water chamber to Wolf Lake.

Although chemical tanks and proportioning system are in place, they have so far not been needed. The water discharged from the flotation unit is clear enough without extra treatment.

Results: Use of the Colloidair Separators has reduced suspended solids and oil and grease in the waste water, has reduced BOD, and has raised the dissolved oxygen content, so that waste sent to the lake is now in conformance with pollution abatement standards. Following is a table showing average partial analysis of influent to flotation unit (from the skim basin) and of effluent from the flotation unit. This test data was compiled as a result of extensive composite pilot plant testing and laboratory analysis conducted at the Lever plant before the complete, commercial installation was installed.

	Influent to Colloidair	Effluent from Colloidair
Suspended Solids, ppm	370	22
Oil and Grease, ppm	120	21
BOD, ppm	175	24
Dissolved Oxygen	4.4	7.4
Turbidity	80	10

In general, full-scale plant results substantiated pilot plant results with the exception that improved plant operations have materially reduced the solids content of plant effluent.

As an extra bonus in this installation, even though of secondary importance in this case, about 400 lb of grease, previously being lost with the waste effluent, are recovered every day.

(Colloidair Separators are designed by Bulkley, Dunton Processes, Inc., Dept. CP, 295 Madison Ave., New York, N. Y. . . . or for more information reader may simply check CP 5125 on the convenient Reader Service slip located between pages 2 and 3.)

**YOUR COMPANY
NAME GOES HERE**



Pictured is your test and pilot plant for FILTRATION

Are you making the most of it?

The Bird Research and Development Center is located in South Walpole but it is just as ready to go to work for you as if it was right on your own grounds. It is equipped and staffed to give you the right answers on filtering performance and cost *before* you spend money on filters. Its findings will be unbiased because Bird builds a wide range of filtration equipment. Findings will be held in strictest confidence for you.

These facilities also give you an opportunity to check your present filtering operations and see if they are as effective and economical as they should be.

Why not take advantage of these superb test facilities whenever a solids-liquids separation problem arises.

BIRD MACHINE COMPANY
South Walpole . . . Massachusetts

When inquiring check CP 5126 on handy form, pgs. 2-3

IF YOU HAVE ANY OF THESE PIPING PROBLEMS

- MISALIGNMENT ● EXPANSION
- CONTRACTION ● VIBRATION

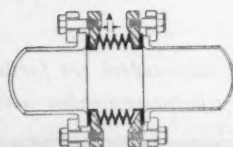
You Need "TEFLON" Bellows Molded by Doré



Utilizing the highest technical skill and most modern facilities, we are molding "TEFLON" Bellows of uniform density and close wall tolerances. And, to insure quality and precision of the finished product, every Doré Style E-8 Bellows is rigidly tested and inspected prior to shipment.

Our "TEFLON" Bellows are inert to a wide range of commodities. They are built for 25 lb. W.P. and are available in sizes 1" through 12" diameters. The flanged-to-flanged relaxed dimension ranges from 2 inches to 5 inches. Additional sections in the Bellows will increase the length to compensate for greater flange-to-flange distances. Immediate delivery is made on both standard and special sizes of Bellows. When ordering, specify pipe size and flange-to-flange dimension.

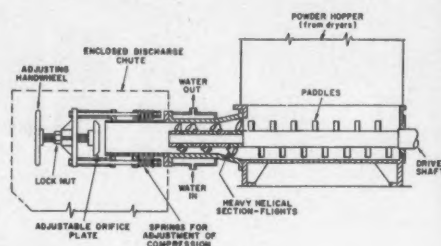
Do business with Doré for "TEFLON" sheets, rods, tubes, packing sets, gaskets, tapes and special molded shapes. Order your standard or special molded "TEFLON" Shapes from Doré.



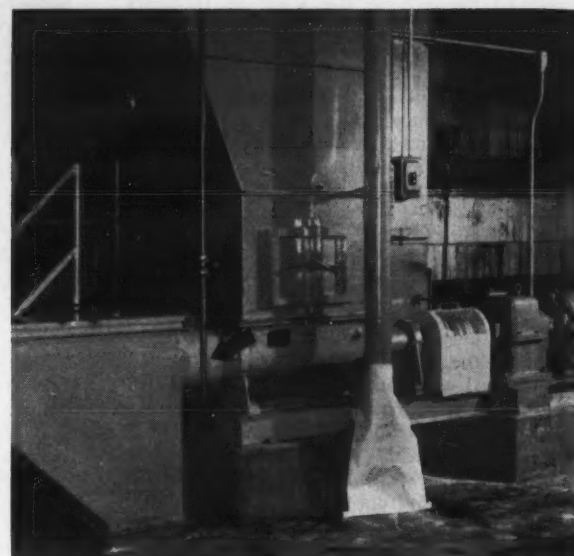
John L. Doré, Co.

SALES AGENTS IN U.S.A. FOR JOHN L. DORÉ, INC.
MOLDERS OF "TEFLON" AND "KEL-F" SHAPES
P. O. BOX 7772 • HOUSTON 7, TEXAS

Simplified sketch of densifier interior



*new solutions
of processing problems*



Densifier at Marathon Corporation stands in front of two atmospheric drum dryers. Compression takes place in water-jacketed section denoted by arrow. Pipe dropping down to bag in foreground is for the coarse and hard material screened out atop hopper of densifier

ALL PRODUCTS SOLD AT SAME BULK DENSITY —NO MATTER WHICH DRYER IS USED

Light material from atmospheric drum dryers is densified to same unit weight as that from spray and vacuum drum dryers

Problem: During expansion of its facilities for producing chemicals from sulfite pulp mill spent liquors, Marathon Corporation, Rothschild, Wis., installed three types of dryers: atmospheric drum, vacuum drum, and spray. Each did a fully satisfactory job of drying the various products it handled, but a troublesome factor was the difference in bulk density between product dried by atmospheric drum dryers (about 25 lb/cu ft) and that dried by vacuum drum and spray dryers (about 35 lb/cu ft).

Because of this density difference, Marathon dried only one product, Marasperse CB, on the atmospheric drums so that each bag of it (and the other products) would be of standard weight. Ob-

viously, such inflexibility made production scheduling difficult, and sometimes inefficient use was made of the drying, bagging and accessory equipment.

Another troublesome procedure was the storing of two different sizes of bags for the two bulk densities.

Solution: Late in 1952, the company started using a machine called a densifier for bringing up the bulk density of product dried on an atmospheric drum. This machine consists essentially of a screw which forces material through a small, variable annular space against pressure of a spring-loaded plate (see drawing). The unit was designed by Marathon engineers in cooperation with an outside manufacturing firm which built the machine. It has a capacity of about 800 lb/hr, and can deliver a product with a bulk density up to 45 lb/cu ft, using feed material of 25 lb/cu ft.

Dried material is taken from the atmospheric drum dryers by screw conveyors which empty into the boot of a bucket elevator. The elevator raises the powder to a screen above the hopper of the densifier where large, hard particles are removed. Level in the densifier hopper is maintained between

When inquiring check CP 5127 on handy form, pgs. 2-3

two set points by automatic control of densifier screw speed. Level is controlled by Bin-Dicators.

The higher bulk density material leaving the unit falls directly into the feed hopper of a Model B Coddington sacker. This auger type unit, now standard throughout the plant, fills the valve type bags which are also standard.

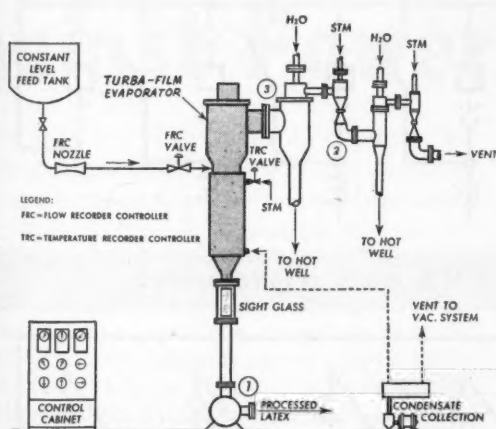
Results: Now it is much easier to schedule drying production since, in effect, any dryer may be used for any product. All products now have essentially the same bulk density, so it is no longer necessary to warehouse different size bags.

(The densifier was built by The Bonnot Company, Dept. CP, Canton, Ohio . . . or for more information check CP 5128 on handy form, pages 2 and 3.)

Continuous latex concentration takes 20 seconds, but is still highly efficient . . .

turbulent film evaporator delivers product having higher solids content, minimizes losses

A continuous method of stripping monomers or ammonia from synthetic rubber, natural rubber, and plastic latices has been inaugurated in the plants of several leading rubber manufacturers. In most cases a single 20-second pass, at low temperatures, is sufficient. The latex ends up with superior physical properties, there is negligible loss of material as coagulum, stripping is more complete, a higher



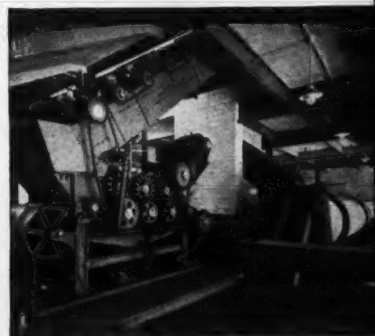
Flowsheet of latex stripping and/or concentration plant. For some products, blow case vacuum receivers are used at (1). A surface condenser or compressor is used at (2) when monomer recovery is needed. A foam trap may be installed at (3) if desired

solids content is obtained when desired, and product loss in the vapor stream is practically eliminated, even with products which foam badly. Here are some typical results:

Natural Rubber:— Easily stripped to practically

(Continued on next page)

**more than 50 years
of experience in
designing and
building dryers
for industry . . .**



Louisville dryers

**used throughout
the world for
great efficiency
with low maintenance**

**LOUISVILLE DRYING
MACHINERY UNIT
GENERAL AMERICAN
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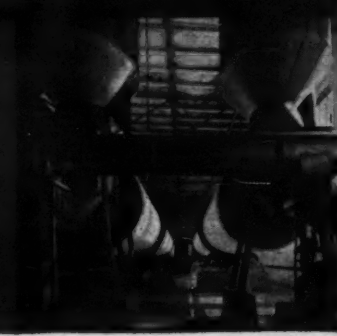
Dryer Sales Office: 139 S. Fourth Street, Louisville 2, Kentucky
General Offices: 135 South LaSalle Street, Chicago 90, Illinois
In Canada: Canadian Locomotive Co., Ltd., Kingston, Ontario
OFFICES IN ALL PRINCIPAL CITIES



KNOW THE RESULTS BEFORE YOU BUY

Louisville engineers will test your dryer needs in our laboratory. When required, a pilot model will be checked in your plant before full-size dryers are built.

Louisville's creative engineering pre-determines results for you!



When inquiring check CP 5129 on handy form, pgs. 2-3

(Continued from preceding page)

any ammonia alkalinity. Rates of 180 lb latex/hr/sq ft of heat-transfer surface have been attained while reducing total alkalinity content from 2.0 to 0.55% and increasing total solids content from 62 to 64% at 100°F. The ammonia content can be reduced to as low as 0.05% if desired, or almost completely removed. Latexes can be concentrated to a maximum of about 72%. Practically no coagulum is produced.

GRS:—A 39% total solids feed can be concentrated to 66%, with satisfactory styrene removal; practically no coagulum produced. Feed rates go up to 60 lb/hr/sq ft of heat-transfer surface. Viscosity of concentrate is reported to be lower than that obtained with other processes.

Synthetic rubber and plastic latexes:—These can be processed at rates similar to natural rubber latex and GRS. Styrene, acrylonitrile, butadiene, vinyl chloride, chloroprene, etc., are removed. High solids content has been obtained for a wide range of products.

The Turba-Film evaporator used in process utilizes principle of evaporation from a turbulent thin film. Controlled-speed rotor blades whirl the latex out against the heated wall where it forms a thin film which spins in a gravity flow through the chamber, down, and out the bottom. Vapors rise into a separating section where rotor blades beat out entrained droplets and force them back through the evaporating section. This principle permits concentration to high viscosities and solids contents.

Overall heat transfer coefficients as high as 370 Btu/sq ft/hr/°F have been obtained in stripping and concentration of latexes.

All operations must and can be controlled in most cases so as to permit proper operation in spite of the difficulties caused by latex properties such as coagulation due to shearing action, films formed by air-drying, sensitivity to heat and changes in pH, increase in viscosity with increased concentration, and tendency to form stable and copious foam.

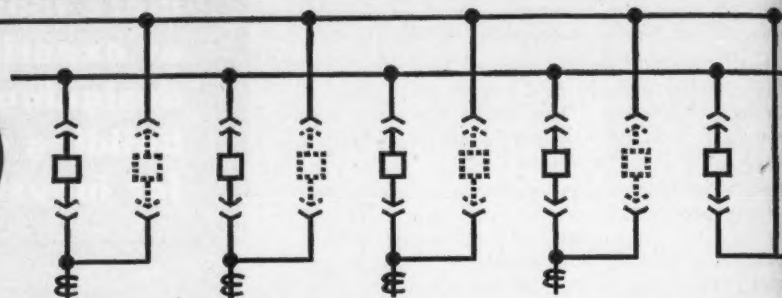
(The Turba-Film evaporator is manufactured by Rodney Hunt Machine Co., Process Equipment Division, Dept. CP, Vale Street, Orange, Mass. . . . or for more information reader may simply check CP 5130 on handy Reader Service slip, pages 2 and 3.)

**CaCO₃ removed from liquors
in 1/2 instead of 16 hours,
by filtration . . .**

neater method, using a carbonaceous filter aid, increases clarified liquor recovery 10 to 15%

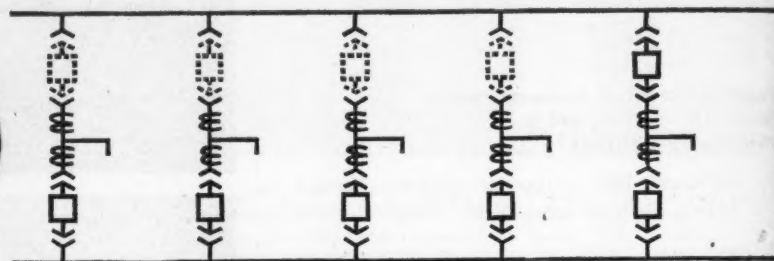
Problem: It took close to 16 hours to remove fine calcium carbonate solids from alkaline lignosulfonate liquors in one of the processes used at Marathon Corporation's Chemical Division plant, Rothschild, Wis. Separation was done by first set-

1



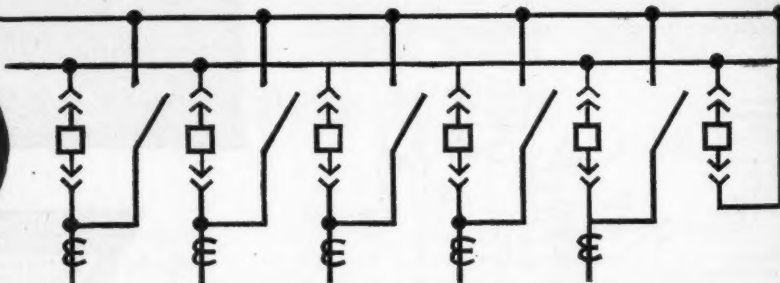
DOUBLE BUS in line

2



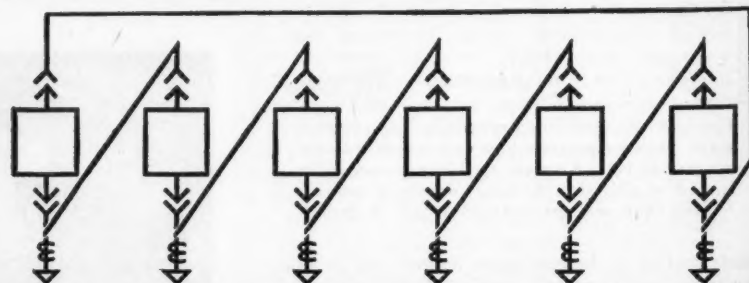
DOUBLE BUS back-to-back

3



TRANSFER BUS and disconnect

4



RING BUS

Switchgear

4 WAYS to Guard Against Power Interruption

Here are a few of the many different circuit arrangements Allis-Chalmers can provide. All are designed to assure continuity of service. Each one is specially suited for specific situations.

With Allis-Chalmers switchgear, all these circuit schemes have one advantage in common. Each arrangement shown can be built into standard units of Allis-Chalmers metal-clad switchgear without adding extra cubicles. This economy and simplicity, plus the obvious space savings, make Allis-Chalmers equipment especially attractive.

Which Arrangement is Best? A study of your problem is needed to answer this question. Any one of these arrangements may be best for your plant. Or maybe an entirely different scheme is needed. In any case, Allis-Chalmers engineers can help you work out the best scheme for you . . . one that provides ✓ economy, ✓ simplicity, ✓ space saving, and ✓ uninterrupted service.

For complete information, call your nearby A-C district office, or write Allis-Chalmers, Milwaukee 1, Wisconsin.

A-4135

ALLIS-CHALMERS



When inquiring check CP 5131 on handy form, pgs. 2-3

DECEMBER, 1953

NEW SOLUTIONS of processing problems

tling in two tanks (each 23,000 gal) and then passing the partially clarified liquors through two filter presses.

The lignosulfonate liquors are received from the neighboring vanillin plant of Salvo Chemical Co. (division of Sterling Drug) who gets them originally from Marathon. After removal of the calcium carbonate, Marathon uses the liquors in making their Marasperse CB dispersant and boiler water treating compounds.

Solution: Early in 1953, this old system of clarification was abandoned. Now, all the liquor is filtered on an Oliver precoat filter which has 300 sq ft of filter area, and maintains an average filtration rate of approximately 7 gal/sq ft/hr. It removes practically all of the finely divided carbonate (6 to 8% by volume).

Largely responsible for the success of the new process is the carbon filter aid, Nerofil, produced by the Great Lakes Carbon Corporation in pilot plant quantities at their Central Research and Development Division, Morton Grove, Ill. This material



Precoat filter at Marathon

has flow rate, cake density, and other properties in the same range as diatomaceous earth filter aids, but is capable of being used in alkaline solutions irrespective of pH, hydrofluoric acid, fluorinated compounds and similar applications where diatomaceous earth is not fully satisfactory.

Results: Daily production of liquor (by Salvo) is now processed in 1/2 hour instead of the previous 16 hours. Because of more efficient separation, 10 to 15% more lignosulfonate liquors are obtained. Operation is much neater than with the old system.

(Precoat filter is a product of Oliver United Filters Inc., Dept. CP, 2900 Glascock St., Oakland 1, Calif. . . . or for more information check CP 5132 on handy form, pages 2 and 3.)

(Nerofil filter aid is sold by Dicalite Division, Great Lakes Carbon Corporation, Dept. CP, 612 S. Flower St., Los Angeles 14, Calif. . . . or for more information reader may simply check CP 5133 on the convenient Reader Service slip located between pages two and three.)

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toughness

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tailor-made
for
qualities
you want

NEW RESYN 10K-25

—a polyvinyl acetate emulsion designed to deposit tougher films with high water resistance and superior clarity.

Toughness and water resistance are shown by over 850 strokes without failure on Gardner wet rub tester. Compares with only 19 to 150 strokes for regular polyvinyl acetate emulsion. Films 3 mils thick (wet) air dried 24 hours.

Your problems may be easily solved by a new vinyl acetate polymer or copolymer in emulsion, solution or hot melt form.

Address: National Starch Products (Resin Division),
270 Madison Avenue, New York 16, N. Y.

DATA

Solids	55%
pH	4-5
Particle Size	Mostly under one micron
Viscosity	About 2500 cp thins rapidly on dilution



National

RESYNS® • ADHESIVES • STARCHES

When inquiring check CP 5134 on handy form, pgs. 2-3

NEW SOLUTIONS of processing problems



Two-stage extruder in operation at Hercules

Pre-drying eliminated by two-stage plastics extruder . . .

resulting pellets are free from porosity

Problem: At the Parlin, N. J. plant of Hercules Powder Co., an economical means for preparation of high quality samples of cellulose acetate and ethyl cellulose molding powder was needed. Extrusion equipment was desired that would handle samples of 100 pounds or more with a minimum of preparation to assist in development and experimental work.

Solution: A NRM Model 2530 two-stage extruder was acquired and placed in operation in the plastics laboratory. Unit is primarily intended to be used for devolatilizing and, in addition, as one of the final stages in a compounding and coloring operation.

Feed screw has two flight sections, with a torpedo-like valve section in between. First section of the screw is utilized for pre-heating. In it the material is forwarded and heated to a soft plastic state ready to be passed over the torpedo valving section and into the devolatilizing chamber. Then as the material passes over the valving section, it actually enters the devolatilizing chamber as a rather thin sheet or tube. Consequently, any moisture or volatile gas which might be entrapped will be quite close to the surface. As soon as it enters the open portion and pressure is released, volatile gases and moisture flash off.

After the material is devolatilized, it is again picked up by a flight section on the front of the screw, forwarded to the strainer plate and screens and on through the die. Compounded strands 3/16" in diameter are chopped on a rotary cutter into pellets 1/8" long. Pellets can then be compression molded, injection molded, or extruded.

One point of interest is the fact that the rear section



tt
TUBE-TURN

Remember the trade marks "tt"
and "TUBE-TURN" are applicable only
to products of TUBE TURNS, INC.

**Your choice
for strong,
leakproof
piping!**

This TUBE-TURN Concentric Reducer is designed with the smoothest reductions and the strongest knuckle contours consistent with adequate tangent lengths and the end-to-end dimensions established for this type fitting by the American Standard. TUBE-TURN Reducers are superior to the pipe in bursting strength and their fatigue life equals that of the butt weld used to join them to the pipe.

For piping installations that are maintenance-free and have extra long life, specify TUBE-TURN Welding Fittings and Flanges. Your nearby TUBE TURNS' Distributor is at your service with industry's most complete line.

The Leading Manufacturer of Welding Fittings and Flanges

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DISTRICT OFFICES: New York • Philadelphia • Pittsburgh • Cleveland • Chicago • Denver • Los Angeles • San Francisco
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ENGINEERING SERVICE

TUBE TURNS' Engineering Service

shows the way to eliminate equipment shutdowns

● In the past, directional changes in the tubes used in fuel economizers for boilers have been made with flanged U-bends or with header boxes. Although leakage was inevitable sooner or later, and repairs difficult, such conventional connections were necessary to permit periodic dismantling and mechanical cleaning.

Now, improved methods of water treatment have eliminated the need for such cleaning in most cases, and with it, the need for joints that can be readily disassembled. Accordingly, TUBE TURNS' Engineering Service has recommended re-fabricating tube assemblies with TUBE-TURN 180° Welding Returns, which are available in thicknesses and radii to match the tube walls and centers of most economizers.

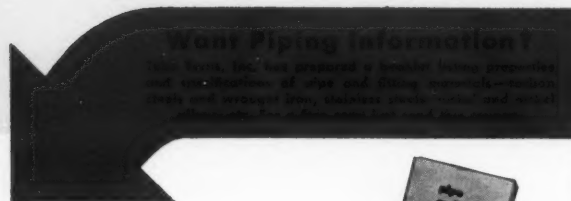
The result has been the elimination of any leakage in economizer tubing, thus ending shutdowns of economizers, boilers, and other critical equipment. In addition, pressure drop is reduced, and flow conditions improved. When you have a tough piping problem, bring it to TUBE TURNS' Engineering Service—a service that typifies TUBE TURNS' leadership in piping engineering.



At top: flanged connections in economizer. At bottom: permanently leakproof, TUBE-TURN Welding Returns.



Shop fabrication of welded piping assemblies is easy, thanks to the uniform wall thickness and dimensional accuracy of TUBE-TURN Welding Fittings. Line-up is fast and accurate.



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Position
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of the screw is smaller in diameter than the front section. This makes it possible to remove the screw through the front of the extruder without having to dismantle anything other than the die. Clearance of the valving section can be altered by an axial adjustment of the screw.

Results: Principal advantage of the extruder realized by Hercules is the elimination of the pre-drying step. Also the resulting pellets are free from porosity and are well compounded. This is true because the volatile gases and moisture have been drawn off after the material has been heated to a temperature at which these gases are easily released. Hence, when the machine is used in a pelletizing operation, the resulting pellets are of a very dense nature and prove to be satisfactory for use in molding or extruding operations which follow.

It should be pointed out that 100 pounds or more of sample is required for this type of unit in order to produce a sufficient quantity of pellets. Hence, it should not be used for small samples, but is well suited for longer laboratory production runs. Also, it is necessary to know the correct operating conditions in advance for a particular formulation.

(NRM Model 2530 two-stage extruder is manufactured by National Rubber Machinery Co., Dept. CP, 47 W. Exchange St., Akron, Ohio . . . or for more information check CP 5135 on handy form, pages 2 and 3.)

Mercuric acetate made direct from metallic mercury . . .

method should be 1/3 less expensive than usual processes which go via salt

Patents are now pending on a process which makes mercuric acetate directly from mercury, at about 1/3 less the expense of current processes which derive the acetate from mercury salts. Yields from the new process are nearly theoretical, and the acetate is said to be very pure.

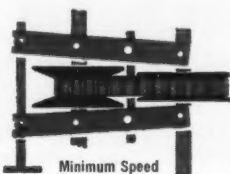
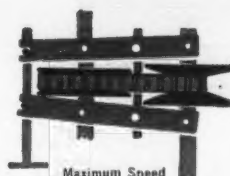
Metallic mercury is treated with peracetic acid in a glacial acetic acid medium. Mercurous acetate is first formed, and this is converted to the mercuric acetate by heating in the presence of excess acetic acid.

Commercial peracetic acid (made with sulfuric acid as a catalyst) cannot be used in this process because insoluble mercuric sulfate would be formed. Peracetic acid made with nitric acid as the catalyst is suitable.

(Process was developed by Buffalo Electrochemical Company, Inc., Dept. CP, Buffalo, N. Y.)

For more information on product at left, specify CP 5136 . . . see information request blank between pages 2 and 3.

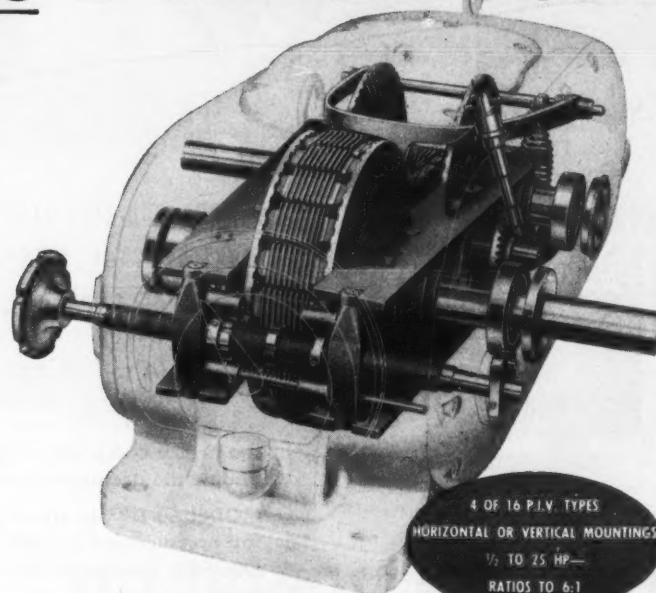
Always POSITIVE... Always STEPLESS



Note how the effective diameter of P.I.V.'s wheels can be altered to change their ratio. You can select any point—from maximum to minimum setting—and get positive, accurately maintained speed.

ALL INDUSTRY USES P.I.V.*

*Positive, Infinitely Variable



4 OF 16 P.I.V. TYPES
HORIZONTAL OR VERTICAL MOUNTINGS
1/2 TO 25 HP—
RATIOS TO 6:1

P.I.V. Variable Speed Drive gives you infinite speed choices

SELECT ANY SPEED within normal operating range, and you can always be sure Link-Belt's P.I.V. Variable Speed Drive will maintain it accurately under full load conditions.

P.I.V. is not dependent on friction for power transmission. Self-tooth-forming chain meshes with grooved wheels to provide positive, infinitely variable speed selection. Using P.I.V., your machines are capable of working to maximum capacity according to the job. Control can be manual or automatic while running under full load.

Link-Belt's P.I.V. Variable Speed Drive is compact. It is particularly

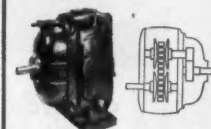
adapted to delicate or sensitive manufacturing processes that require exacting variable speed transmission. Find out how you can increase the flexibility and efficiency of your machines. Call your nearest Link-Belt office today for complete, detailed information. Send for Catalog No. 2274.



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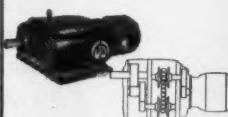
Basic, Positive, Infinitely Variable (P.I.V.) Speed Drive.



P.I.V. with single reduction input or output helical gears.



Motorized P.I.V. with single reduction input and output helical gears.



Motorized P.I.V. with single reduction input and double reduction output helical gears.

When inquiring check CP 5137 on handy form, pgs. 2-3

DOUBLE DOUBLE DRAINAGE

AT LOWER COST WITH



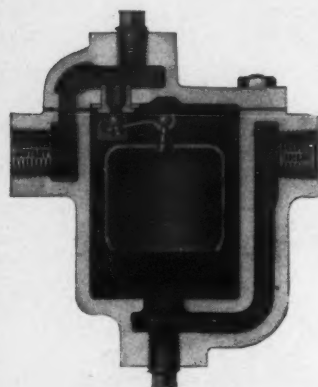
FAMOUS DUO-STEP LEVERAGE IS NOW AVAILABLE FOR THE FIRST TIME ON THESE SMALLER SIZED STEAM TRAPS. GET HIGHEST DRAINAGE CAPACITY AT LOWEST COST.

Duo-Step is the revolutionary double fulcrum principle that affords maximum leverage to "crack" the valve from the orifice seat, teamed with "Follow-through" power that opens the orifice completely. This double action actually gives you double the drainage capacity of ordinary steam traps.

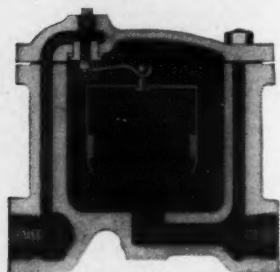
MODEL 60-D traps are of cast semi-steel construction, designed for pressures up to 200 P. S. I. and temperatures to 400° F. Duo-Step levers and brackets of stainless steel construction. Seats and discs are of Clark-loy. ½" or ¾" horizontal inlet and outlet connections with ¼" test outlet and drain plug. Vertical inlet can be furnished in ½" or ¾" size.

MODEL 70-D traps are of cast semi-steel construction, designed for pressures up to 200 P. S. I. and temperatures to 400° F. All working parts of stainless steel construction. Seats and discs are of Clark-loy Horizontal inlet and outlet connections located at bottom of trap body for close-to-the-floor installations.

MODEL 70-TD for pressures to 150 P. S. I. and temperatures to 375° F. is available WITH BUILT-IN THERMAL BY-PASS at additional cost.



CLARK 60-D TRAP



CLARK 70-D TRAP



FOR COMPLETE
INFORMATION
CONTACT YOUR CLARK
REPRESENTATIVE OR
WRITE FOR **NEW**
DUO-STEP BROCHURE

HOME OF DUO-STEP LEVERAGE Clark

MANUFACTURING COMPANY

1830 EAST 38th STREET
CLEVELAND 14, OHIO

Distributors and Representatives in all major cities

NEW SOLUTIONS of processing problems

**Acid, hot caustic, and abrasion
withstood by coating based
on chlorinated rubber . . .**

eliminates downtime due to repainting steel
and repairing concrete floors

Problem: For the past four or five years, the Pharmaceutical Div. of Burroughs-Wellcome Co., of Tuckahoe, N. Y., had a serious erosion problem on equipment and concrete floors in their process area. Plant had to cope with sugar acids spilled on floors. In addition, in order to maintain the cleanliness and prophylaxis required for their products, floors, process machinery, and structural steel had to be washed down with hot caustic solutions several times daily.

In one area sugar crystals were falling on the floor where material is loaded into steel-wheeled hoppers from chutes. The sugar was being ground into the floor because of the 1000 lb trucks and hoppers rolling over it. Handling of heavy 55 gal drums of sugar solutions, as well as sugar acids and caustic lying on the floors, contributed to the wear of the cement floors, which had become pitted and eroded. Production was stopped several times a year in order to patch and repair the floors and paint the structural steel, process equipment, and tanks again. According to the Division Supervisor, dozens of paints and coatings were tried, but the maximum life of any of them was one month.

Solution: A test patch of a chlorinated rubber base coating, known as Lankote 700 Series, was applied to the concrete floor in the worst area in February, 1952. After one month, the coating showed no sign of attack. Steel-wheeled trucks and 55 gal drums were detoured directly over the test patch. Sugar crystals were dropped intentionally on the test area. Caustic and sugar acids were poured on it. When the coating was still in excellent condition after a few months of such treatment, the maintenance engineer said that it was the finest floor coating he had ever used. It was found to be standing up even on diamond-plate steel walks over the process equipment.

In June, 1952, Burroughs-Wellcome coated all of the cement floors in the process areas with three coats of Series 700. All of the structural steel, process equipment, supports, and tanks subject to the conditions described were coated with Series 400, the companion product to the Series 700 coating.

Lankote 700 and 400 Series Coatings are based primarily on a chlorinated rubber resin. Main difference between the two coatings is the amount of plasticizer employed. Series 400 contains an extra

Data Reduction Problems?
A new basic approach to S-shaped
curves is embodied in the data
presented on pages 194, 196, and 198

When inquiring check CP 5138 on handy form, pgs. 2-3

NEW SOLUTIONS of processing problems

amount of a plasticizing resin in order to give a greater degree of flexibility for use on wood and metal.

In the 700 Series, the plasticizer is reduced in order to achieve greater toughness and abrasion resistance for use on concrete and masonry where flexibility is not required. Remainder of formulation for each series is made up of inert pigments to give desired colors and hiding power, and of solvents which are released upon drying. In addition, stabilizers are employed to resist heat and light in order to increase the life of the coating.

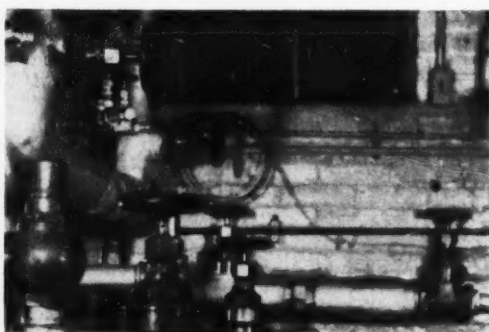
Results: Since the coatings were used in the process areas in June, 1952, no downtime has occurred on equipment for concrete patching and metal repainting. There are no traces of erosion on the concrete floors, equipment, and structural steel. To date, no sign of attack is evident on either type of coating.

(Lankote 400 and 700 Series Coatings are based primarily on a chlorinated rubber resin produced by Hercules Powder Company, Wilmington 99, Delaware. The coatings are manufactured by Lankote Division, J. Landau Company, Department CP, 221 Wooster Street, New York 12, New York . . . or for more information about manufacturer's product, reader may simply check CP 5139 on handy form, pages 2 and 3.)

Fuel oil at 225°F and 200 psi resisted by bronze valves for 15 years . . .

are in service at Chas. Pfizer in Brooklyn

Problem: At the Brooklyn plant of Chas. Pfizer & Co., Inc., valves were needed for transfer of fuel oil between pump and heater in the steam



Bronze gate valves at Chas. Pfizer & Co. in fuel oil service are shown above

generating system. In this service valves were required that would satisfactorily withstand the conditions of 225°F and 200 psi.

Solution: Approximately 15 years ago the 3" No. 370 bronze gate valves shown in accompany-

(Continued on next page)



no tubing job is too BIG for TRENTWELD

A famous manufacturer, engaged in atomic energy work, had a problem. Large quantities of stainless steel tubing were required — in sizes larger than regularly manufactured commercially.

Trent solved the problem by producing a 36" O.D. x 1/4" wall stainless tube in five to six foot lengths, and then butt welded two sections together to make the ten to twelve-foot lengths required.

Your particular application may not call for extra-size tubing, but no matter what size or shape you require Trent can fill your needs promptly — we produce the largest assortment of tubing sizes in the industry, from 1/8" to 40" O.D.

And when it comes to quality, you just can't buy better tubing than TRENTWELD. That's because TRENTWELD stainless welded tubing is a product of tube mill specialists. Each tube has a uniformly sound weld indistinguishable from the parent metal and just as strong and corrosion resistant.

Next time you need stainless or high alloy tubing specify TRENTWELD.

TRENTWELD

STAINLESS STEEL TUBING

TRENT TUBE COMPANY, GENERAL SALES OFFICES, EAST TROY, WISCONSIN (Subsidiary of CRUCIBLE STEEL COMPANY OF AMERICA)

When inquiring check CP 5140 on handy form, pgs. 2-3

For You— The 1954 edition of KOPPERS Synthetic CHEMICALS



Di-tert-Butyl-para-Cresol
Impruvol 20® Antioxidant
Impruvol 33® Antioxidant
Styrene Monomer
Ethylbenzene
Diethylbenzene
Divinylbenzene
Polystyrene
Polystyrene Emulsions
"KTPL" Resins
C-4 Aromatic Solvent
Resorcinol

beta-Methyl Umbelliferone
beta-Resorcylic Acid
Penacalite® Adhesives
Penacalite® Resins
Barium Cyanide
Sodium Cyanide
Potassium Cyanide
Phthalic Anhydride
Sulfuric Acid
Mono-tert-Butyl-meta-Cresol
Catechol
Sodium Sulfite

Diphenylaminechlorarsine

● Bulletin C-3-103, shown here, lists the properties, reactions and uses of 25 synthetic organic chemicals produced by Koppers Chemical Division. Most of these chemicals have established commercial applications, and in addition, offer rich, new fields of investigation to research and development chemists. The Bulletin describes all 25 of the products listed above.

WRITE NOW FOR YOUR FREE COPY.

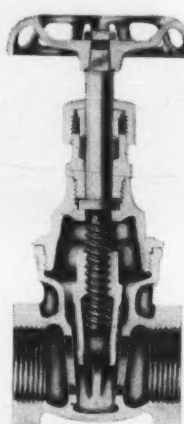
Koppers Chemicals
KOPPERS COMPANY, INC.
Chemical Division, Dept. CP-123, Pittsburgh 19, Pennsylvania

When inquiring check CP 5141 on handy form, pgs. 2-3

NEW SOLUTIONS of processing problems

(Continued from preceding page)

ing photograph were placed in operation. Details of the construction of this type of valve may be seen in sectional view. The spindle does not rise in this type of design. Sturdy solid wedge resists pressure strains and adds to valve life. When valve is fully open, wedge entirely clears pathway, affording unobstructed flow equal to that of pipe. Body and screw-in bonnet are liberally proportioned to withstand abuse.



Sectional view of bronze gate valve

Results: Valves have stood up well under the specified temperature and pressure conditions, still being in excellent operating condition. Outside of being overhauled two or three times, the only maintenance necessary has been packing at regular intervals. The gate valves are regularly inspected once a year.

(Fig 370 bronze gate valves are product of Jenkins Bros., Dept. CP, 100 Park Ave., New York 17, N. Y. . . or for more information reader may simply check CP 5142 on the convenient Reader Service slip located between pages 2 and 3.)

A \$25 paint can cost less than one priced at \$5

One-page educational leaflet points out that a paint costing \$25 per gallon can be more economical to the user than one priced at \$5 per gallon. While no particular brand of paint is promoted, the buying of coatings on the basis of solids content is recommended so that in corrosive atmospheres the most protection can be had for the least labor. Leaflet contains charts and data on film thickness, film porosity, comparative costs of labor and material, and other information that is of interest.

Bul 120 is issued by Carboline Co., Dept. CP, 331 Thornton Ave., St. Louis 19, Mo. When inquiring specify CP 5143 on handy form, pages 2 and 3.

Supplementary list of
CHEMICAL SHOW EXHIBITORS
will be found starting
on page 173

Slo-Speeds Improve Paint Quality

Vertical, face mounted Slo-Speeds on our 300-gallon paint mixing vats have improved product quality, reduced production costs and decreased maintenance. Slo-Speeds require less space, provide greater safety, permit lower cost installation, and give us the exact low speed for our requirements in a single, compact, quiet, rugged unit, reports J. E. Gauntt, of Stebbins & Roberts, Inc., Little Rock, Ark.

STERLING SLO-SPEED



GIVES YOU THE ONE BEST LOW SPEED AND

gives uninterrupted service—carries heavy overhung loads—provides versatile mounting and flexibility in arrangement of machinery—saves valuable space—provides greater safety—costs less to install and use. An indispensable source of low speed power for:

Agitators	Dryers	Presses
Blenders	Feeders	Pumps
Blowers	Kilns	Screens
Conveyors	Mills	Tumblers
Cookers	Mixers	Etc., etc.

20-page illustrated catalog . . .
Sterling Speed-Trol, Slo-Speed, Kloss and Kloss-Tite Electric Power Drives. Write for catalog No. C-414

STERLING
ELECTRIC MOTORS

Plants: New York City 51; Chicago, Ill.; Los Angeles 22; Hamilton, Canada; Santiago, Chile
Offices and distributors in all principal cities

When inquiring check CP 5144 on handy form, pgs. 2-3

CHEMICAL PROCESSING

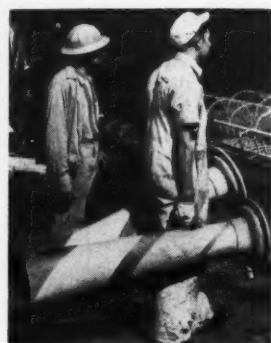
**On-the-spot ventilation provided
by portable air movers for
interior painting . . .**

Dravo Corp. saves time and labor in safety

Problem: The Paint Dept. of Dravo Corp., Pittsburgh, has to furnish ventilation to barges, towboats, and interior installations ashore while painting. First, dust-laden air has to be removed from compartments during power brushing prior to painting. Then ventilation is needed during painting and afterwards for paint-drying. It is also necessary to remove noxious fumes generated when preservatives are applied to machinery prior to storage.

In the past, 200 lb blowers had to be transported by crane for each job.

Solution: Venturi-type portable air movers, such as those appearing in accompanying photograph, were placed in service, six being obtained initially. The air mover is horn-shaped, with a bell-formed base.



One man can easily carry
two lightweight air movers
to the job site

Each one weighs 31 lb. Compressed air introduced through the annular orifice in the base is discharged at high velocity from the outlet horn, inducing air movements in large volume. Those used at Dravo have a rated discharge capacity of 3150 cfm, at 70 psi compressed air pressure. Either compressed air or steam may be used with the device. The air movers have no

moving parts. Where necessary, they may be made explosion-proof by grounding.

For a large room, it is customary procedure to use several of the air movers at once to facilitate rapid ventilation. At Dravo, two are sometimes used to exhaust a large compartment, and two more to blow in fresh outside air to replace the exhausted air.

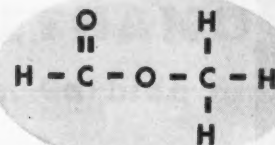
Results: On-the-spot ventilation is readily available with the air movers. Transporting ventilation to the job is now a matter of a few minutes for one man, instead of 20 minutes for several men. One man can easily carry one or two of the devices to the job site. Safety also is a practical advantage of the units, because of the absence of moving parts or motors.

Initial outlay for the air movers is said to be quite low in comparison with motor-driven equipment.

Other departments now borrow the air movers on occasion to gas-free oil or gasoline barges.

(MSA-Lamb Air-Movers are product of Mine Safety Appliances Co., Dept. CP, Braddock, Thomas, and Meade St., Pittsburgh, Pa. . . or check CP 5145, pgs. 2 and 3.)

**AN IDEA-CHEMICAL
FROM DU PONT**



METHYL FORMATE

CHEMICAL PROPERTIES

READILY HYDROLYZED to methanol and formic acid by water containing traces of acids or bases.

REACTS WITH

- Ammonia to give formamide.
- Hydrogen in presence of catalysts to give methanol.
- Chlorine in the presence of light to form methyl chloroformate and chloromethyl formate . . . with an excess of chlorine to form trichloromethyl chloroformate.

SOLUBILITY DATA:

SOLUBLE IN WATER at 20°C. up to 30% by weight.

MISCIBLE with practically all organic solvents.

DISSOLVES cellulose esters and ethers, acrylic resins and polyvinyl acetate.

**Here is a
versatile, low-boiling ester
you should investigate**

Methyl formate is a low boiling (31.75°C.) solvent and chemical intermediate with a pleasant ester odor. Soluble in water up to 30% by weight, it is miscible with practically all organic solvents . . . is an economical and efficient solvent for cellulose ethers and esters, acrylic resins and polyvinyl acetate.

Chemically, methyl formate is readily hydrolyzed to methanol and formic acid . . . finds application in the manufacture of formates and other organic chemicals, including sulfa drugs. It is commonly used as an ingredient in fumigants because of its low boiling point.

Investigate the use of Du Pont methyl formate in your business. We'll be glad to send you more information on this versatile material—specifications, properties, suggested uses. Just send in the coupon below or write on your letterhead. E. I. du Pont de Nemours & Co. (Inc.), Polychemicals Department, Wilmington 98, Delaware.

GRADE AND AVAILABILITY: Du Pont methyl formate is a water-white, mobile, volatile liquid with 97.0% minimum ester content as methyl formate. It is available in tank cars and 55-gallon non-returnable drums.

SERVING INDUSTRY WITH IDEA-CHEMICALS

AMIDES • ALCOHOLS • ESTERS • ORGANIC ACID • SOLVENTS • RESINS



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Better Things for Better Living
. . . through Chemistry

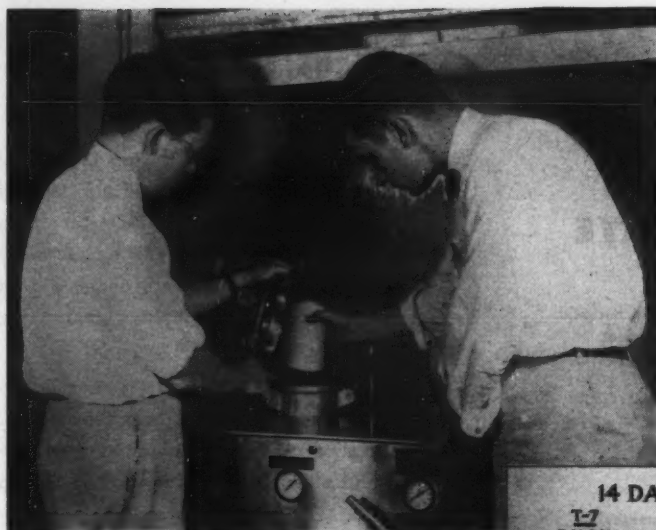
Polychemicals
DEPARTMENT
CHEMICALS • PLASTICS

E. I. du Pont de Nemours & Co. (Inc.)
Polychemicals Department 5812, Wilmington 98, Del.

Please send me more information on Du Pont methyl formate—specifications, properties, suggested uses, bibliography, etc. I am interested in evaluating methyl formate for the following applications:

Name _____ Title _____
Firm _____
Address _____
City _____ State _____

When inquiring check CP 5146 on handy form, pgs. 2-3



Institute of Textile Technology research workers removing a package of yarn from the apparatus used to change cotton into T-7 yarn

T-7 and cotton samples taken after the fabrics had been buried for two weeks. Note that the T-7 samples are undamaged, while the cotton samples are disintegrated

materials



NEW FIBRES FROM COTTON

Via Cyanoethylation

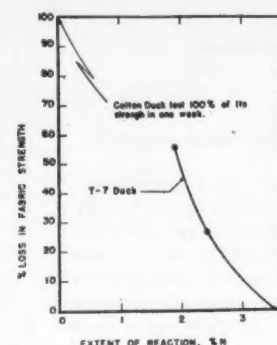
Process retains familiar characteristics of cotton fibres, makes them dye better, be stronger, resist micro-organisms

A new family of fibres from cotton — designated as T-7 — has been developed by the Institute of Textile Technology. The fibre series is produced by reaction of ordinary cotton fibre, yarn, or fabric with a chemical during a basic process called cyanoethylation. Process transforms cotton

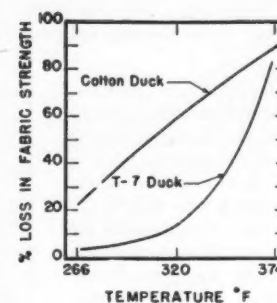
into a structurally different type of fibre.

T-7 fibres retain the appearance, hand, and other familiar characteristics of cotton but take on important added properties — 1) they have permanent resistance to micro-organism attack such as mildew and bacteria, 2) they retain strength to a greater degree after exposure to wet and dry heat, and 3) they are more receptive to all classes of dyes, including dyes which are normally unsatisfactory on cotton.

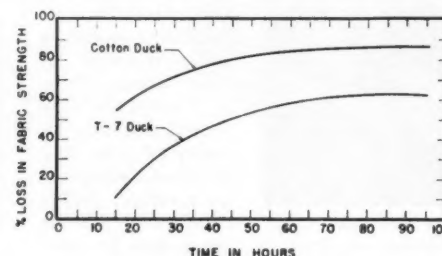
One of the most important features of T-7 fibres is their versatility. As a base material they can be easily altered by subsequent treatments into products having even more desirable qualities. Some treatments of T-7 products have produced



Comparison of the breaking strength of T-7 and cotton duck after the fabrics were buried in soil under controlled temperature and humidity conditions. T-7 samples were buried for two weeks; cotton lost all of its strength in one week



Comparison of the breaking strength of T-7 and cotton duck after heating the fabrics to different temperatures for 15 hours



Comparison of the breaking strength of T-7 and cotton duck after heating the fabrics to 320°F for different periods of time

fibres and yarns which have proven to be considerably stronger and possess increased stretch and greater abrasion resistance than either the original cotton or T-7 products.

The basic chemical used in producing T-7 is acrylonitrile — an established constituent of many synthetic rubbers and the acrylic textile fibres such as Orlon, Dynel, Acrilan, and X-51. The ITT process is said to achieve for the first time the chemical modification of cotton in conventional yarn package treating equipment. With this equipment, both yarn and fibre can be processed, and the whole process is described as relatively simple.

Cyanoethylation offers cotton manufacturers new fibres that can be handled on the same machinery used for spinning and weaving cotton, while at the same time giving many product qualities attainable until now only with synthetics. Manufac-

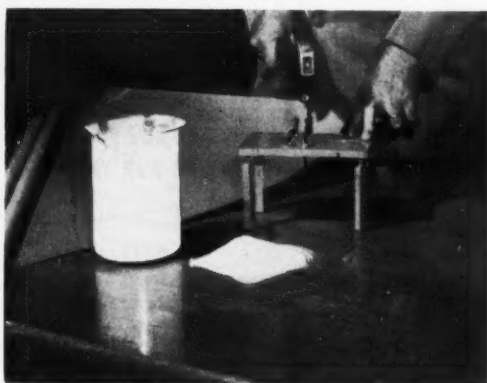
turers can engineer their own fibres on conventional equipment to suit the demands of the end product. Already the success of the process has been demonstrated by commercial scale runs in ordinary yarn-treating equipment. Plans are currently nearing completion for pilot plant production of fibres in several ITT member mills.

(Summary of information received from Textile Information Service, Dept. CP, Suite 1901, 551 Fifth Avenue, New York 17, New York.)

Ten times impact strength of conventional polystyrenes

Two high styrene copolymer resins for molding and extruding plastic products have been announced. Marketed under the name Plio-Tuf, and available in commercial quantities, the resins are expected to expand and create more uses for rigid plastic materials largely because they give 8-10 times the impact strength of the highest impact polystyrene resins.

Plio-Tuf G85C is a thermoplastic resin having a heat softening point of approximately 90°C and a Shore D hardness of 85. Plio-Tuf G75C has the same softening point but a hardness of 75. The synthetic



Illustrating how small table top made with new synthetic resin stands up under heavy pounding — although spikes and screws have been driven into it, it has not splintered

compounds are available as white free-flowing powder which can be pigmented in conventional equipment. They do not require curing ingredients, accelerators, or modifiers. Inherent thermal stability of the resins is said to eliminate need for stabilizers.

Rubber Plio-Tuf blends can be compounded without curing agents, thus making it possible to rework mold scrap. Compounds can be calendered or extruded into sheets for post forming into complex shapes or can be extruded into rods or tubes. Automotive parts, television screens, luggage, plastic pipe, and other items requiring high impact strength are suggested applications.

(Products of the Goodyear Tire & Rubber Company, Dept. CP, Akron 16, Ohio . . . or for more information check CP 5147 on handy form, pages 2 and 3.)

TRIETHANOLAMINE

from Carbide and Carbon

25...for more than
a quarter of
a century

That's how long CARBIDE has been producing and supplying triethanolamine. Of all the amines produced, this viscous, hygroscopic liquid offers one of the widest ranges of uses for emulsions and other chemical processing fields. So, before you decide on any amine, consider CARBIDE's triethanolamine —available in two grades, "regular" and "98 per cent."

A 44-page booklet "Aliphatic Nitrogen Compounds" gives the latest information on physical properties, specifications, and shipping data for triethanolamine and the other amines available from CARBIDE. For your copy, write to the nearest CARBIDE office. Offices located in 21 principal cities. In Canada: Carbide and Carbon Chemicals, Limited, Toronto.

SOME OF THE TYPICAL USES OF TRIETHANOLAMINE:

Industrial Oil Emulsions

increasing solubility of sulfonated oils
wool lubrication
leather fat-liquoring
other oil emulsions

Soluble Oils

soluble mineral oils
cutting oils
textile machinery lubricants
rayon oils
orchard sprays

Solvent Emulsions

hydrocarbon solvent emulsions
chlorinated solvent emulsions

Industrial Wax Emulsions

dispersion of casein, shellac, dyes, and rubber latex
shoe polishes and leather dressings
sizing and water-proof coatings

Oil and Wax Polishes

Rubless Floor Polishes

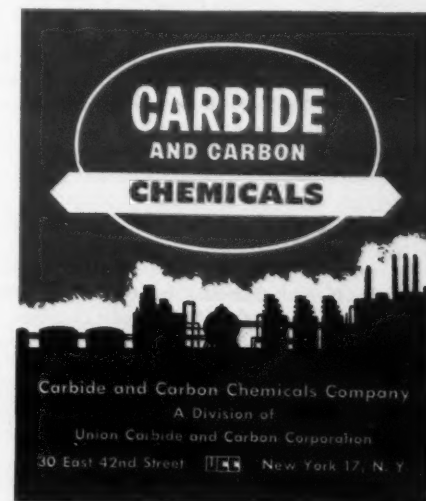
Cosmetic Preparations and Detergents

Neutralize Natural Oils, Clays and Pigments

Photographic Film Developing Baths

Removal of Carbon and Gum Deposits

Corrosion Inhibitor



When inquiring check CP 5148 on handy form, pgs. 2-3

Big future in store for Minnesota's Fe-sulfide ores

Minnesota's iron sulfide deposits in Aitkin and Carlton counties some day may not only provide the state with a new industry — sulfur — but also may prove the missing link in the development of the Cuyuna Range manganese, reports a spokesman for the Bureau of Mines.

Bureau of Mines laboratory tests on iron sulfide ores from two deposits in the Minnesota counties averaged an 87% recovery of sulfur. These concentrates would be a good source of sulfur and its related products.

Relatively low-silica content of the concentrate also indicates that a high-grade iron oxide sinter suitable for blast furnace usage by the steel industry could be produced after recovery of the sulfur from concentrates.

Flotation tests were conducted by Bureau metallurgists following an extensive drilling program during 1950-1951.

Even more important is the possible use of these iron sulfide deposits in the development of a manganese industry from Cuyuna Range manganiferous ores. Using sulfur dioxide gas, the Bureau is conducting pilot-plant tests in the recovery of manganese from Cuyuna carbonate slate ore in a sulfatizing furnace. This will be followed by the final leaching step in a flotation mill to be installed in the Bureau's manganese pilot plant at Fort Snelling.

If the use of sulfur dioxide gas in the process under investigation is as successful as laboratory tests have indicated, there is a definite tie-in between the eventful development of the Cuyuna Range manganese-bearing iron ores in Crow Wing and Aitkin counties and the nearby iron sulfide deposits in Aitkin and Carlton counties. Iron sulfide could be burned to produce sulfur dioxide gas for use in the recovery of manganese. Link together North Dakota lignite as a potential source of fuel and power for a commercial plant, and three great natural resources from the two States could mean a new industry.

(Summary of information provided by Bureau of Mines, Department of the Interior, 2908 Colfax Avenue, South, Minneapolis, Minnesota.)

Revised data on 2,4-D

A revised technical bulletin on 2,4-D contains a list of nearly 1000 weeds classified according to their reaction to the herbicide. Bulletin includes physical and chemical data on the various forms of 2,4-D, plus biological data and methods of application. Bul 0-50 is issued by the Organic Chemicals Division of Monsanto Chemical Company, Dept. CP, 1700 S. 2nd St., St. Louis 4, Missouri. When inquiring specify CP 5149 on the convenient Reader Service slip located between pages 2 and 3.



MANY INDUSTRIES FIND NEW USES FOR ARMOUR ETHO-CHEMICALS

By Dr. M. R. McCorkle, Technical Director,
Armour Chemical Division

The unique properties of Armour's fat-derived surface active agents make them useful in countless industries, not only as emulsifiers, but as detergents, wetting agents, and suspending agents. These polyethylene oxide derivatives of fatty amides, fatty acids, and fatty amines are available in commercial quantities from the Armour Chemical Division under the trade names Ethomids®, Ethofats®, and Ethomeens®. Pigment dispersing, insecticide emulsifying, print and chenille soaping, paint and rust removing, buffing compounds, polishes, shampoos, hair creams, dyes are just a few of the many applications where Armour Etho-Chemicals have proved new, economical tools for industry.

ETHOMIDS

The Ethomids are N, N-substituted fatty acid amides, the substituents being polyoxyethylene groups. In common with other fatty amides, the Ethomids are chemically neutral and rather unreactive. These compounds are stable in acid or alkaline solutions although they can be hydrolyzed with concentrated bases and acids under strenuous reaction conditions—products of such hydrolysis are fatty acids and di-polyoxyethylene amines. The Ethomids may also be esterified at the terminal hydroxyl groups of the polyoxyethylene chain.

One of the ways industry is using Armour Ethomids successfully is in preparing carnauba wax emulsions. The old method was a lengthy process, requiring two kettles to heat the water and the wax-and-emulsifier. A faster method was developed with Ethomid HT/25 in which less than one-third of the water is heated and the entire emulsion is prepared in only one kettle.

ETHOFATS

The Ethofats are mono-fatty or rosin acid esters of polyethylene glycols. These esters are fairly stable in mildly acid or alkaline solutions. They can, however, be hydrolyzed by refluxing with strong acids or alkalis. Members of the 242/series are

somewhat more resistant to hydrolysis than the other Ethofats. The Ethofats may be further esterified at the free hydroxyl group to give polyethylene glycol di-esters. They may also be sulfated at the hydroxyl group to give sulfated esters.

Besides many applications in agriculture, the leather industry, etc., Ethofats have proved effective with paper products, performing such jobs as de-inking paper. One of the problems in reclaiming newsprint is to rid the paper of the grey cast due to retained, dispersed ink in the pulp. Ethofat 242/25 used in a reclaiming formula gave a brightness of 10 to 15 points higher measured on the G. E. Spectrophotometer. This is a brightness increase noticeable to the human eye.

ETHOMEENS

The Ethomeens are tertiary amines having one fatty alkyl group (derived from various fatty sources having from 12 to 18 carbons atoms) and two hydroxyethyl or polyoxyethylene groups attached to the nitrogen. The Ethomeens are cationic in nature although increasing the ethylene oxide content causes these compounds to behave more like non-ionics.

The textile industry provides an interesting case of the extra advantages of Ethomeens. Ethomeen S/15 added to the mineral oil lubricant makes an excellent textile lubricant and antistatic agent. But the Ethomeen S/15 also acts as an emulsifier for the mineral oil, so that merely a warm water rinse removes the oil from the cloth. The free booklet offered in the coupon at right will help you in ordering samples of these versatile Etho-Chemicals.

NEW DOUBLE-DUTY EMULSIFIER

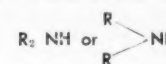
Emulsifier 1869, a new combination of Armour's surface active agents, eliminates buying two or more emulsifiers for insecticide and pesticide operations because it does both jobs equally well. Emulsifier 1869 is a combination of surfactants blended to give maximum emulsifying properties and

both soft and hard water emulsion stability. It is soluble in aromatic, chlorinated and polar solvents, but insoluble in naphtha and kerosene. Emulsifier 1869 has proved to be an excellent emulsifier for Chlordane, Lindane, DDT, Toxaphene and both low volatile ester of dichlorophenoxyacetic (2,4-D) and trichlorophenoxyacetic acid (2,4,5-T). Send for samples and data.



FIRST TIME UNSATURATED SECONDARY FATTY AMINES EVER OFFERED TO INDUSTRY!

Two new unsaturated secondary amines produced from tallow and soya are now available for your testing. These are the first unsaturated secondary fatty amines to be offered to industry and have been made possible only by new developments in manufacturing methods. These compounds, Armeen® 2T and 2S, have the following general configuration:



Because of the unsaturation in both compounds, these two secondary amines are more easily liquefied than the corresponding saturated secondary amine (Armeen 2HT), and will show better solubility in organic solvents.

Average analyses of Armeen 2T and 2S are given here:

	ARMEEN 2T	ARMEEN 2S
Secondary Amine Content	85%	85%
Primary Amine Content	5%	5%
Neutralization Equivalent	520-540	520-540
Iodine Value	35 min.	60 min.
Temperature to Liquefy	50° to 55°C	45° to 50°C
Color	Light Tan	Light Tan

These products are so new that possible uses have not yet been explored extensively. However, the chemist acquainted with the reactivity and polar substantivity of amines and their derivatives will recognize the potentialities of Armeen 2T and Armeen 2S in corrosion inhibitors, lubricant additives, rubber processing, textile treating compounds, emulsifiers, etc. Send the coupon for samples and solubility data on these secondary amines which are available for your testing.

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ARMOUR CHEMICAL DIVISION

ARMOUR AND COMPANY • 1355 WEST 21ST STREET • CHICAGO 9, ILLINOIS

INCREASE PRODUCTION OF HIGH-QUALITY GREASE WITH NEO-FAT® 65



A double distilled animal fatty acid, Neo-Fat 65 is of a composition which for years has been recognized as advantageous for grease formulations. It is produced by the most modern methods, closely controlled to meet rigid specifications, assuring uniform composition and greater yield. Approximately 95 pounds of Neo-Fat 65 can be substituted for 100 pounds of neutral fat to obtain the same yield. And at least two batches of soap made with Neo-Fat 65 can be run in the time required for one using glycerides. For these reasons, manufacturers can expand production without purchasing new equipment or expanding their plants. By using Neo-Fat 65, you get greater output of high quality grease—and the savings in production more than offset the slightly higher raw material cost. Send the coupon for free samples.

PURE CAPRYLIC AND CAPRIC ACIDS CAN BE BUILDING BLOCKS FOR MANY NEW PRODUCTS

The availability of Armour's high purity caprylic (Neo-Fat 8) and capric (Neo-Fat 10) acids should interest many processors working on new product development, particularly that involving organic synthesis.

These two coco fractions are available with purity of 92% or above. The average composition of Neo-Fat 8 is 93% caprylic, 4% capric, and 3% caproic. Neo-Fat 10 averages 92% capric, 5% lauric and 3% caprylic acids.

Samples of these two versatile chemicals can show you how readily they can be put to work for you. Write today on your letterhead for these samples and a copy of our booklet, "Coconut Oil Fatty Acids."

FRACTIONALLY DISTILLED TALL OIL FATTY ACIDS FILL MANY NEEDS IN VARIOUS INDUSTRIES

Crude tall oil, a by-product of paper manufacture, is the cheapest organic acid available. Due to low price it has found many applications, but such disadvantages as its odor and color have prevented more widespread use. Also the fact that crude tall oil is a mixture of fatty acids, rosin acids and pitch has further limited its use.

However, Armour's patented fractional distillation process makes available to you three tall oil fractions with many uses.

Neo-Fat 42-70 is a mixture of rosin acids and fatty acids—a low-cost fractionally distilled product. In protective coatings, Neo-Fat 42-70 is used for modified ester gums, phthalic alkyds, P. E. esters, etc. It is especially well suited to soap manufacture. Like rosin, it can be blended readily with other fats, oils and fatty acids. Saponification is almost instantaneous.

Neo-Fat 42-70 is an efficient, economical, easily saponified swelling agent for rubber reclaiming. There are many other applications for this fatty acid, including core oils, linoleum, floor coverings and greases.

Neo-Fat 42-12 is a fatty acid composed of 46% oleic, 39% linoleic, 3% linolenic acids and 12% rosin (average composition). It has a maximum titer of 15; iodine value, 125; acid value, 190-196; unsaponifiable content 3.5%; moisture 0.5%; color, Gardner standards, 9 max. or on a 1" Lovibond column, 3R-30Y max.

Modified alkyd resins made from Neo-Fat 42-12 are remarkably flexible and free of the characteristic embrittlement of alkyds made from ordinary refined or distilled tall oil acids. Neo-Fat 42-12 may be esterified with a polyhydric alcohol to produce a good quality semi-drying oil.

Neo-Fat 42-12 is particularly useful in the manufacture of jell, liquid and dry cleaning soaps. It provides considerable savings in operating cost, due to the ease and rapidity with which it saponifies. Other applications include ore flotation, cutting oils, liquid buffing compounds, carbon paper—in fact, wherever a low titer unsaturated fatty acid is required, Neo-Fat 42-12 should be investigated.

Neo-Fat 42-06 is produced by the re-

distillation of Neo-Fat 42-12 for lighter color and lower rosin acid content. Average composition: 50% oleic; 40% linoleic; 4% linolenic acids and 6% resin. It has a maximum titer of 17; iodine value of at least 125; acid value of 193-198; unsaponifiable content 2.0% max.; moisture content 0.5% max.; and color, Gardner standards, 4 max. or on a Lovibond 5¼" cell a maximum color of 4R-40Y.

Modified alkyd resins made with Neo-Fat 42-06 have excellent adhesion to metal even without a primer coat or undercoat. Amazing toughness and flexibility are also secured with these alkyds. Neo-Fat 42-06 alkyds greatly reduce the sagging and running common to alkyd enamels, and have good resistance to alkalis and water.

Neo-Fat 42-06 is also excellent for liquid and jell soaps as well as waterless hand cleaners. In water-emulsion wax formulations, Neo-Fat 42-06 will replace oleic acid with equal or better results. Other applications include rust preventatives, metal polishes, ore flotation, metal cleaning and insecticide emulsifiers.

Samples of these three products are available for your testing. Send the coupon on your letterhead for samples of any of these tall oil products.

LOW-COST NEO-FAT 125 ASSURES COLOR-HEAT STABILITY IN ALKYDS

Neo-Fat 125 is an entirely new low-cost, heat-stable, light colored unsaturated fatty acid raw material for the alkyd industry. Its heat and color stability carry through all stages of alkyd manufacture—raw material storage, alkyd cooking, finished alkyd storage, and exposure after application to such alkyd enemies as atmospheric gases, soaps, greases, and other common household chemicals.

Rigid quality control of Neo-Fat 125 during manufacture, and intensive color, processing and drying tests after manufacture, assure alkyd producers fast, uniform cooking and drying times.

Send the coupon for free samples of this new, economical raw material for alkyds and Technical Bulletin A-8.

Applications for fatty alcohols

Use of Cachalot brand cetyl, oleyl, and stearyl alcohols in various applications is told in booklet entitled "Possibilities with Fatty Alcohols". Emphasis is placed upon chemical synthesis. Issued by M. Michel and Company, Incorporated, Dept. CP, 90 Broad Street, New York 4, New York. When inquiring specify CP 5151, pgs. 2 & 3.

DDT combinations found effective in control of cotton pests

Cotton enemies such as the pink bollworm, boll weevil, cotton aphid, bollworm, cotton leafworm, and spider mites may be controlled by spray combinations of DDT with methyl parathion or metacide, according to entomologists of the USDA. Large-scale spray tests in the Lower Rio Grande Valley in 1952 indicate that DDT-methyl parathion or metacide combinations may give farmers plagued by these pests a method of producing cotton far more economically.

With no single insecticide now available that will control all of the cotton pests, attention in the Rio Grande Valley experiments was focused on finding combinations of two insecticides that would accomplish the job.

The possibility of better utilizing fewer cotton acres is indicated by the fact that average seed yield from test fields sprayed with the DDT-methyl parathion and DDT-metacide combinations were almost three times the yield from untreated test areas. In one field sprayed with DDT and methyl parathion combined, a gain of 1600 pounds of seed cotton per acre was obtained over the untreated area. All tests were carried out by USDA's Bureau of Entomology and Plant Quarantine in cooperation with the Texas Agricultural Experiment Station.

Spray applications were begun on April 15th, when about 10% of the blooms were infested with the pink bollworm, and continued until July 3 at intervals of about a week. The number of applications made varied from 11 in one of the fields to 3 in another and averaged a little more than 6 per field. This was below the average for applications of other sprays on many farms where the pink bollworm was a problem in 1952. The percentage of bolls infested by the pink bollworm averaged 61.2 in the untreated areas, 15.7 in areas sprayed with the DDT-methyl parathion combination, and 14.9 in areas sprayed with DDT and metacide combined. The methyl parathion-DDT combination held the boll infestation in one test to an average of 9% while that in the corresponding check area averaged 63.1%.

Dieldrin was added to the other materials in some of the final applications to provide better control of the heavy, late-season migrations of the boll weevil. Methyl parathion in combination with DDT appeared slightly more effective against the boll weevil than the metacide-DDT combination.

(Information courtesy of United States Department of Agriculture, Agricultural Research Administration, Washington, D.C.)

When inquiring check CP 5150 on handy form, pgs. 2-3

Send literature: ☐ Etho-Chemicals Booklet ☐ Unsaturated Amines Product Bull.
☐ Tech. Bull. A-8 ☐ Coconut Oil Fatty Acids
Send samples: ☐ Emulsifier 1869 and data ☐ Neo-Fat 65 ☐ Neo-Fat 42-70
☐ Armeen 2S ☐ Armeen 2T ☐ Neo-Fat 125 ☐ Neo-Fat 42-12
☐ Neo-Fat 42-06 ☐ Neo-Fat 8 ☐ Neo-Fat 10

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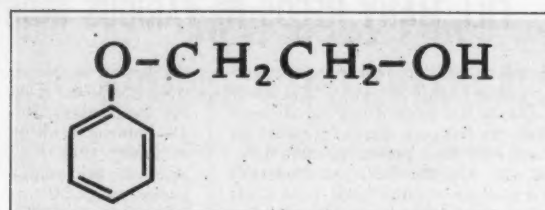
PYRONATE
(water-soluble)

PETRONATES
(oil-soluble)

ISOPETRONATES
(low viscosity)

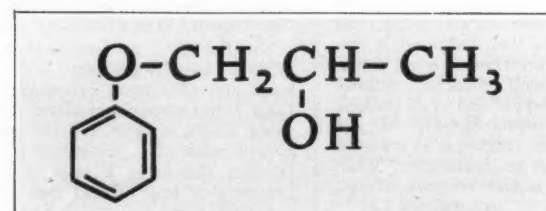


L. SONNEBORN SONS, INC.
New York 10, N. Y.



Suggested uses for aromatic glycol ethers:
high-boiling solvents, chemical intermediates

materials



Ethylene and propylene glycol phenyl ethers available in quantity, in pure or technical grades

Uses: These aromatic glycol ethers are finding application as high-boiling solvents and as chemical intermediates in the manufacture of plasticizers, bactericidal agents, and fixatives for soaps and perfumes.

Features: Ethylene and propylene glycol phenyl ethers are currently available in commercial or experimental quantities, in either technical or purified grades.

Description: Ethylene glycol phenyl ether (Dowanol 1) and propylene glycol phenyl ether

(Dowanol 2B) are almost colorless liquids. It is reported that they present no unusual handling hazards; nevertheless, due care should be exercised, since they are irritating to the eyes and possibly the skin.

Solubility for both products in common organic solvents is high. Both ethers are infinitely soluble in 100 grams of the following solvents at 25°C: acetone, benzene, carbon tetrachloride, ether, and methanol. Dowanol 1 is soluble to the extent of 2.7 grams in 100 grams of V.M.P. naphtha and

	Dowanol 1		Dowanol 2B	
	Technical	Pure	Technical	Pure
Specific Gravity 25/25°C	1.104-1.107	1.104-1.107	1.060-1.070	1.060-1.070
Boiling Range @ 760 mm Hg. °C	240-295 (5-95%)	240.0-248.0 (IBP-DP)	237-242 (5-95%)	237-242 (5-95%)
Phenol (max). %	0.6	0.3	1.0	0.05
Color APHA (max)	100	50	100	100
Acid Number (max)	0.5 mg KOH per gm	0.15 mg KOH per gm	—	—

When inquiring check CP 5152 on handy form, pgs. 2-3

PHYSICAL PROPERTIES

Physical Property*	Dowanol 1 (ethylene glycol phenyl ether)	Dowanol 2B (propylene glycol phenyl ether)
Molecular Weight	138.2	152.2
Specific Gravity @ 25/4°C	1.103	1.063
@ 60/4°C	1.075	1.032
Boiling Point, °C**		
@ 760 mm Hg	245	240
@ 100 mm Hg	176	172
@ 10 mm Hg	120	117
Viscosity, centistokes		
@ 100°F	9.55	10.45
@ 130°F	4.88	5.10
@ 210°F	1.59	1.59
Flash Point, °F	275	275
Fire Point, °F	275	275
Freezing Point, °C	11-13	13-18
Refractive Index @ 25°C	1.536	1.523

*Average values obtained from both purified and technical samples.
**Data obtained on purified material.

2.0 grams in 100 grams of water — all at 25°C. At the same temperature, Dowanol 2B is infinitely soluble in V.M.P. naphtha, but insoluble in water.

The story of these two ethers can best be told by tabular presentation of physical properties and specifications that have been set up for the technical as well as the purified grades. This accompanies this article in adjacent columns.

(Dowanol 1 and 2B are products of the Dow Chemical Company, Midland, Michigan . . . or for more information on manufacturer's product reader may simply check 5153 on the convenient Reader Service slip located between pages two and three.)

See Mexico as world's 2nd largest sulfur producer by '55

Mexico, historically a small producer of sulfur, is rapidly emerging as a major source of brimstone among the sulfur-producing nations of the world. In 2 years hence Mexico is expected to become the world's second largest supplier, second only to the US in production.

Successful operation of Petroleos Mexicanos' sulfur recovery plant at Poza Rica, Mexico, in March 1951 brought sulfur exports in that year to 7000 tons, whereas exports were only 330 tons as recent as two years previously.

Currently it produces 120 tons of sulfur daily from hydrogen sulfide gas.

Comprising Frasch-process, gas recovery, and volcanic deposit developments, the expected down-to-earth Mexican sulfur production figures are given in gross tons as follows: 1952, 48,000; 1953, 94,000; 1954, 201,000; and 1955, 383,000.

(Summary of report from S. Schwartz & Associates, Dept. CP, 165 Broadway, New York 6, New York.)

Davison Bulletin

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DRY AIR and GAS AVAILABLE

You can have dry air in your control instruments or buildings where operations require low humidity. Dynamic adsorption can accomplish this efficiently, economically by forcing air or gas-air mixtures containing moisture through a layer or bed of chemically inert non-deliquescent silica gel. The adsorptive quality of silica gel removes the moisture making dry air available to meet your requirements. Today telephone cable producers, confectionary suppliers, libraries, ship cargo holds, etc., are dependent upon silica gel dry air systems. Many industrial gases such as nitrogen, oxygen, methane, hydrogen, bromine, chlorine, etc. are efficiently dried with silica gel.

FREE

Literature on Sylaid® AL-1 (prevents pressure build-up in metallic paints) and Sylaid® 162 (alkyd-urea flattening agent for synthetic finishes). Mail coupon for literature giving chemical and physical properties, use data, etc.

LIQUID DEHYDRATION

The presence of moisture in a liquid is often a source of operating difficulty in its application or a deterrent in the sale of the liquid. Davison silica gel offers an efficient means of moisture removal from practically all types of liquids, including dielectric oils, waxes, kerosene, benzene, toluene, methyl chloride, Freons, Gase-trons and other halogenated hydrocarbons.

For help with your drying problem see your Davison Field Service Engineer or write.

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Please send me information on

- ☐ Liquid Dehydration
☐ Sylaid AL-1
☐ Sylaid 162

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Company
Street Zone..... State.....
City

When inquiring check CP 5154 on handy form, pgs. 2-3



**PUT MORE
SOLIDS INTO
SUSPENSION
WITH
MARASPERSE**

MARASPERSE dispersants are more effective and considerably more economical to use. They are completely soluble in water, are non-hygroscopic, non-fermenting, non-caking, free-flowing powders. With the addition of as little as only .05% to a maximum of 3.0% of MARASPERSE, (based on weight of solids), from 35% to over 300% MORE solids may be dispersed and maintained in fluid suspension.

Marasperse stabilizes water dispersions of insoluble solids by setting up repulsive forces on the particles, thereby preventing flocculation.

MARASPERSE products are used in making water suspensions of organic pigments, sulfur, clays, titanium dioxide, carbon black, phenyl-beta-naphthylamine, etc., as dispersing and leveling agents for dyestuffs. Also as deflocculants and to increase strength in the manufacture of ceramic ware. As grinding aids and emulsifiers. In formulation of wettable powder insecticides, industrial cleaners, boiler water treatment chemicals. For mud control in oil well drilling operations.

Write for File No. 301. You will receive complete technical data on Marasperse products. Also available on request is Bulletin No. 119 entitled "Marasperse for Stabilizing Oil-In-Water Emulsions". Marathon has increased greatly its facilities for the production of Marasperse dispersants with the result that they are once again available to new users in virtually unlimited quantities.



MARATHON Corporation
CHEMICAL DIVISION • ROTHSCHILD, WISCONSIN

When inquiring check CP 5155 on handy form, pgs. 2-3

MATERIALS

Announce new source for four fungicides

The Vancide fungicides are mixtures of different metal salts of dimethyldithiocarbamic acid and 2-mercaptobenzothiazole. All mentioned below are widely compatible with other spray materials with which they would normally be used.

Vancide 51 (the sodium salts). Available as water solution or dry, water-soluble powder. Promising as soil drench for control of soil-borne organisms, seed treatment, and fruit preservation. Effective for foliage when tank-mixed with zinc sulfate, manganese sulfate, or iron sulfate.

Vancide Z-65 (the zinc salts). White, wettable powder, insoluble in water. Controls fruit and foliage diseases on both fruit and vegetable crops. Also used as seed protectant, and in soil applications for soil-borne organisms.

Vancide F 995W (the manganese salts). Tan, wettable powder, insoluble in water. Very promising as foliage spray on vegetables and fruit, where it not only controls disease but also brings about excellent fruit finish and verdant foliage.

Vancide F 956W (the iron salts). Black, wettable powder, insoluble in water. Good as foliage spray where black residue is not objectionable, such as early season apply spraying. Tends to produce much darker green leaves than normal. Has looked especially good when used in combination with Vancide F 995W, each at one-half normal dosage. In this case, residue is lighter in color and an intermediate greening of leaves has been observed.

(Vancides are produced by R. T. Vanderbilt Co., Inc., but can be obtained through Niagara Chemical Division, Food Machinery and Chemical Corporation, Dept. CP, Middleport, N. Y. . . . or for more information check CP 5156 on handy form between pages two and three.)

Tells how to make creams, lotions

"Cosmetic and Drug Manual" contains the latest formulas for many commercial products. Compiled by a leading consultant and cosmetic and pharmaceutical chemists, the manual is said to be authoritative and practical.

Formulas and working directions are given for making creams (emollient, greaseless, make-up, hand, protective, hair, shaving, and deodorant), lotions, shampoos, lipstick, and mascara. Pharmaceutical formulas include ointment bases, medicated ointments, and dermatitis lotions.

Sections are devoted to emulsion techniques and cosmetic raw materials. Charted are chemical, physical, and solubility data on polyhydric alcohol fatty acid esters. Copies of manual are available from Glyco Products Company, Incorporated, Dept. CP, 26 Court Street, Brooklyn 1, New York. When inquiring specify CP 5157 on handy form, pages 2 and 3.



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Optimum concentrations of Dow Corning Antifoam A against a wide variety of foamers are so small they are measured in parts per million. For instance:

4 p.p.m. (0.0004%) defoams cottonseed oil
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1 p.p.m. (0.0001%) defoams neoprene latex
1 p.p.m. (0.0001%) defoams paper sizing
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Used throughout the processing industry, Dow Corning Antifoam A cuts processing time; increases productive capacity; eliminates waste and hazardous overflow.

Odorless, tasteless and non-toxic, Antifoam A is safe, swift and by far the most economical defoamer you can buy.

DOW CORNING ANTIFOAM AF EMULSION.

Originally developed for use in the food industry, this new water-dispersible silicone emulsion is equally versatile, equally effective in industrial processing of aqueous foamers.

For further information on these materials, we invite you to . . .

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Please send me data and a free sample of—
☐ Dow Corning Antifoam A or
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COMPANY _____
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When inquiring check CP 5158 on handy form, pgs. 2-3

CHEMICAL PROCESSING

MATERIALS

Radioactive organics now number 86

Four new ring labeled aromatics have been added to the list of radioactive carbon compounds available from this concern, making a total of 86.

Uniformly labeled benzene, toluene, and benzoic acid are useful in commercial chemistry since benzene and toluene are raw materials for industrial organics, while benzoic acid is used as a food preservative. Benzene and benzoic acid compounds have activities higher by a factor of 10 than any now being offered.

Labeled benzaldehyde is offered also. Compound is a useful starting material for the synthesis of a wide variety of complex organic chemicals.

All four compounds are available in 1, 0.5, and 0.1 millicurie packages under regular AEC licensing procedures. Products are expected to be useful in fundamental studies in physical, organic, and biological science as well as in process control in industry.

(Products of the Nuclear-Chicago, Dept. CP, 229 West Erie Street, Chicago 10, Illinois . . . or for more information check CP 5159 on handy form, pages 2 and 3.)

Propionic, butyric acids in production

Large-scale production has begun for both propionic acid and butyric acids at the newly constructed special products unit at Celanese's Pampa, Texas, plant. New process involves a 1-step oxidation of natural gas components to acetic, propionic and butyric acids and other chemicals yet to be announced.

Propionic and butyric acid offer useful modifications of cellulose plastics. Other uses of these acids are in surface coatings, lacquers, flavors, and pharmaceuticals.

(Products of the Celanese Corporation of America, Dept. CP, 180 Madison Ave., New York 16, N.Y.)

For more information on product at right, specify CP 5160 . . . see information request blank between pages 2 - 3.

IGEPONS serve every industry

The IGEPONS are today the most widely used surfactants in the world. First introduced by General Dyestuff Corporation more than twenty years ago, these pioneer surfactants have, through the years, become increasingly important to an ever growing number of industries.

Manufacturers of textiles, detergents, paper, cosmetics, industrial chemicals, agricultural chemicals, plastics and scores of other products have found an IGEPON or several IGEPONS essential for their operations.

If you have not investigated these versatile surfactants, let us recommend the IGEPON that is best suited for your product.



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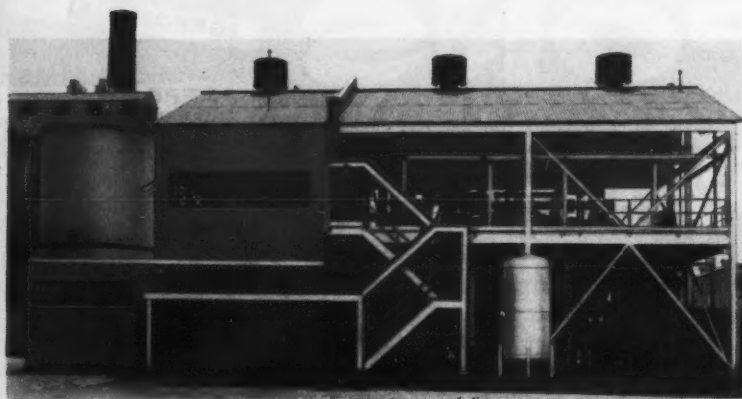
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NEW FA* PLANT

Keeping Ahead of Industry's Demand

MORE QO FURFURYL ALCOHOL!



New Furfuryl Alcohol Plant, Memphis, Tennessee

Quaker Oats is happy to announce the opening of its new plant at Memphis, Tennessee for the production of furfuryl alcohol. The new plant is designed for the manufacture of a high quality product and is so sized that it further improves the good availability outlook on this chemical.

This is good news to the growing number of industries which have found FA useful in the manufacture of a wide variety of products including resinous mortars, cements, binder resins, grinding wheels, textiles (furfuryl alcohol is used as a solvent for the dyes required in the printing operations), and in craze resistant gap filling urea adhesives.

FA is derived from agricultural residues—the abundant supply of which is renewed annually. Now, with the new processing facilities, more and more industries can profit from the advantages of using furfuryl alcohol.

How about your product—have you investigated FA? Send for Furfuryl Alcohol Bulletin 205.

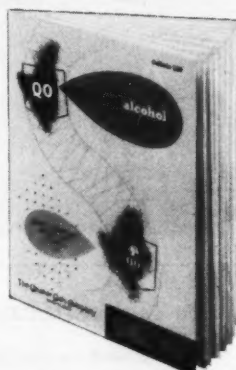


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CHEMICALS DEPT.

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Room 436R, P.O. Box 4376, Portland 8, Oregon
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Quaker Oats (France) S. A., 3, Rue Fillet-Will, Paris IX, France
In Australia: Swift & Company, Pty., Ltd., Sydney
In Japan: F. Kanematsu & Co., Ltd., Tokyo



When inquiring check CP 5161 on handy form, pgs. 2-3

MATERIALS

Diethyl ester of ADA offered commercially

Large-scale production has just been announced for the diethyl ester of acetonedicarboxylic acid. Other esters for this acid are still being offered in laboratory quantities. The esters are stable and may be employed for a wide variety of reactions similar to those in the acetoacetic ester group of syntheses. ADA offers the advantage of having 2 active, symmetrical methylene groups which form symmetrical ring compounds with many reactants.

Esters are recommended for laboratory and commercial production of antibiotics, mydriatics, analgesics and other pharmaceuticals as well as in the production of perfumes, plastics, insecticides, etc. They may be used in the synthesis of atropine and similar compounds. Product is said to form a sodium derivative in alcohol and a sodium salt in water.

(ADA esters are products of Smith-New Yorker Company, Incorporated, Dept. CP, Freeport, Long Island, New York . . . or for more information reader may simply check CP 5162 on handy Reader Service slip located between pages two and three.)

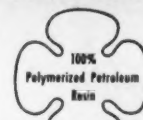
Methyl toluenesulfonate now commercially available

suggested as replacement for methyl paratoluenesulfonate

Available from this manufacturer in commercial quantities for the first time is methyl toluene-sulfonate. Product is a methyl ester of a high ortho-low para mixture of toluenesulfonic acid, and is said to be more stable than methyl paratoluenesulfonate — for which it is recommended as a replacement.

It is also suggested as a catalyst in preparation of alkyd resins and other organic esters, and in manufacture of photographic chemicals and pharmaceutical intermediates.

(Product of the Monsanto Chemical Company, Dept. CP, St. Louis 4, Missouri . . . or for more information on manufacturer's product reader may simply check CP 5163 on handy form located between pages two and three.)



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**PETROLEUM
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- ✓ COMPATIBLE
- ✓ THERMOPLASTIC
- ✓ READILY SOLUBLE

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- ✓ SOLID
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Plants at Clairton, Pa.; West Elizabeth, Pa.; and Chester, Pa.
Distributed by Pennsylvania Folk Chemical Co., Pittsburgh 22, Pa.
and Harwick Standard Chemical Co. Akron 5, Ohio

When inquiring check CP 5164 on handy form, pgs. 2-3

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NUMBERED DUCK
IN ALL WIDTHS AND WEIGHTS

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When inquiring check CP 5165 on handy form, pgs. 2-3

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refined guar gum . . .**

for thickening, film-forming,
and stabilizing jobs

Uses: Hydrophilic colloid can
be employed for a variety of use-
ful applications in the pharma-
ceutical, cosmetic, and food in-
dustries.

Specific uses include bulk-forming
agent in laxatives and appetite
depressants; tablet-disintegrating
agent; in toothpaste, where it gets
the paste to the desired consist-
ency and prolongs shelf life; and
in demulcents and jellies, where
advantage can be taken of ma-
terial's ability to develop its mu-
cilaginous properties over a wide
pH range.

Food manufacturers are using the
colloid for such things as cold
dessert preparation, stabilization
of frozen fruits and fruit drinks,
cheese spreads, salad dressing,
cake icings, as well as many pre-
pared meats.

Features: The hydrophilic col-
loid is being produced commer-
cially, in various mesh sizes and
viscosity ranges.

Description: Refined guar gum
produces high viscosity at low
concentrations, swells quickly in
cold water, and is reported to
have excellent thickening, film-
forming and stabilizing prop-
erties. It is a natural, vegetable,
pure food colloid, which is in-
cluded on the FDA standards of
identity for both cheese and salad
dressing.

Studies indicate that the colloid
swells in gastric and intestinal
fluids.

(*Jaguar* is a development of Stein,
Hall and Company, Incorporated,
Department CP, Murray Hill Build-
ing, New York, New York . . . or
for more information on manu-
facturer's product reader may simply
check CP 5166 on the convenient
Reader Service slip located between
pages two and three.)

For more information on prod-
uct at right, specify CP 5167
. . . see information request
blank between pages 2 - 3.



You can rely on Witco PLASTICIZERS

Characteristic of WITCO esters are their clarity,
absence of color, and lack of odor. These physi-
cal properties in a plasticizer are important in
many applications where the plastic end product
is produced to meet special requirements.

Complete technical service is available to every
user of these WITCO esters. Write today for
technical data and/or samples of the esters in
which you are interested.

Among the ester-plasticizers manufactured
by WITCO are the following:

Butyl Oleate — technical and premium grades
Butyl Stearate — technical and cosmetic grades
Dibutyl Phthalate • Dioctyl Phthalate



WITCO CHEMICAL COMPANY

260 Madison Avenue, New York 16, N. Y.

Boston • Chicago • Cleveland • Akron • Houston • San Francisco • Los Angeles • London and Manchester, England.

**Thickening, reinforcing
suggested applications
for fine silicas . . .**

highly pure silica produced by aqueous process from sodium silicate, then granulated

Next year will see commercial production initiated for this concern's silica products — PL-171 fine silica and Du Pont fine silica. Their predecessor, GS hydrophobic silica (GS-199S), was offered as a grease thickener derived from sand for high-temperature application. The new products are being offered in granulated form, instead of as a fluffy powder, to facilitate handling and shipping.

Fine silica is completely synthetic amorphous silica, composed of spherical particles 8-10 millimicrons diameter bonded together into porous, sponge-like networks. Specific surface area is 300 square meters per gram and there are pronounced hydrophobic and organophilic properties. Products contain approximately 90% silica and are substantially electrolyte-free.

PL-171 has shown considerable promise as a thickener for multi-purpose type petroleum-oil-based greases. Products covering the normal consistency ranges are prepared simply by mixing 7-16% silica with oil and passing the mix through a colloid mill for homogenizer to effect dispersion of the silica. Such greases, in addition to possessing excellent shear stability and non-melting properties usually associated with inorganic thickening agents, also have the following characteristics:

- 1) High degree of water repellency which promises excellent wash-out resistance. Fine silica greases are reported to resist the action of boiling water for several days.
- 2) Excellent oxidation stability in the absence of an inhibitor.
- 3) No loss in consistency after storage at elevated temperature and subsequent working.

Although extensive use-testing of fine silica greases is just beginning, preliminary results indicate that all their excellent properties will be realized in actual usage.

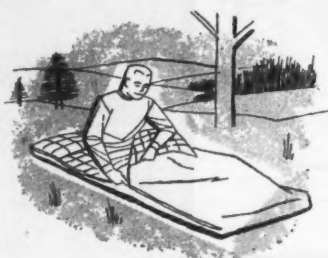
Du Pont fine silica is a companion product being investigated as a rubber filler, with the organophilic properties and a high surface area for good reinforcing action. Although less field information is available, the product shows promise as a filler for silicone elastomers where tensile strengths are outstanding.

Compatibility with organics and very fine particle size are also seen as an advantage for Du Pont fine silica as a thickener and reinforcing filler for plastics and resins. In lithographic inks, the hydrophobic properties together with efficient thickening action offer interesting properties for improved ink formulations. Product has also shown flattening efficiency when incorporated in lacquers and varnishes, with the added possibility of coating reinforcement. Still another type of application is its use as an anti-caking agent, with effectiveness noted even with highly hygroscopic materials.

Both fine silicas are produced from sodium silicate

for your information...

brief summaries of helpful product news



Vinyl Foam Shows Promise in Many Uses

Foam is one of the latest developments in the steadily growing vinyl plastic field.

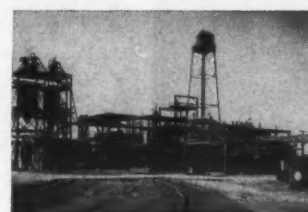
Vinyl foam is light in weight and possesses excellent resistance to perspiration, oils and solvents.

It also has good flame resistance plus a wide color range and excellent light stability. It can be manufactured to any degree of softness or rigidity.

Vinyl foam is being used now for crash padding for athletes and aviators, as well as for kitchenware, boat fenders, life vests, rafts and buoys, arctic apparel, sleeping bags and exposure clothing.

Monsanto plasticizers are essential for processing vinyl foam. They impart flexibility, grease resistance, nontoxicity and flame resistance. They also are compatible, stable to heat and light, and aid in the maximum development of pore size.

Monsanto's di-n-octyl decyl phthalate, Santicizer* 140 and Santicizer 160 are ideal for use in these applications.



West Coast Phenol Unit Now Complete

West Coast users of Monsanto phenol will be assured of fast deliveries from a new phenol plant just completed at Avon, California.

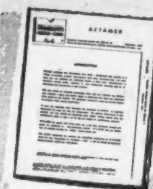
The Avon plant is Monsanto's second phenol-producing unit. It has been built to offer direct service to phenol users from a producing unit in their locality, rather than deliveries from bulk stations or rail sidings.

Monsanto is the only manufacturer with two widely separated phenol plants.

A new booklet, "The Handling of Phenol," has just been released by the company. For your copy, mark and send in the coupon. You may want extra copies for your plant personnel.

New Actamer Bulletin Covers Exhaustive Tests

A bulletin is now available summarizing technical and formulation information on Actamer,* which is Monsanto's brand of bithionol, an improved bacteriostat for soaps and skin preparations.



Complete data is given on one of the most exhaustive test programs ever conducted for a skin application product.

Included are detailed results of handwashing tests comparing the antiseptic activities of Actamer and hexachlorophene. Also included are toxicological and dermatological data.

Tables show the activity of Actamer against a wide range of bacteria and fungi, suggesting beneficial effects in the treatment and prophylaxis of disorders like acne, minor skin infections and athlete's foot. The bulletin also has data on solubility and stability, as well as suggestions for incorporating Actamer in soaps, shampoos, shaving creams, cosmetics and other products.

Mail the coupon for your copy now.



Chloramine-T Cleans Prints

Chloramine-T, Monsanto's water-soluble, chlorine-bearing powder, has a new use—removing rust spots from old manuscripts.

According to museum experts who have used the compound, Chloramine-T can be applied with a brush, doesn't affect the quality of printing or ink, and is simple to use. Send coupon for information.

Benthal Bulletin Available

How to use Benthal* in the production of short and medium oil alkyd resins to control viscosity until the desired acid number is reached is the subject of a new bulletin just published by Monsanto.

The use of Benthal, instead of excess amounts of polyalcohols, improves resin durability, alkali and water resistance, and film gloss, according to data presented in the bulletin. For your copy, send in the coupon.



New Leavening Agent Offered by Monsanto

A new, coated anhydrous monocalcium phosphate with greater stability than any previous product of this type has been put on the market by Monsanto's Phosphate Division.

Called PY-RAN,* the new product is a leavening agent having wide application in all kinds of prepared mixes and self-rising flours.

Laboratory tests on PY-RAN show that it will give a major increase in volume over many other leavening agents. Also, its superior stability gives longer shelf life to products. There is less deterioration, rejected merchandise. The consumer gets consistently better baking results.

Increased stability also brings other benefits such as improved texture and greater tenderness.

Baked goods made with PY-RAN have a uniform, thin-walled cell structure. They also are friable and no longer possess the doughy toughness caused by poor, uncontrolled leavening.

For complete information on this new high-stability form of coated anhydrous MCP—Monsanto's PY-RAN—send in the coupon, today.



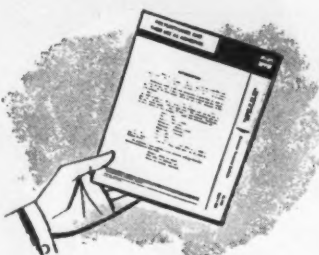
New Alkyl Benzene Bulletin Gives Processing Data

Procedures for obtaining a variety of surface-active end products from the sulfonation of alkyl benzene are contained in a technical bulletin just published by Monsanto.

Batch-type manufacturing procedures are outlined for producing active sulfonates ranging from 40 per cent to as high as 88 per cent active. The bulletin points out that these alkyl aryl sulfonates produced from Monsanto's alkyl benzene can be modified with inorganic phosphates to obtain desired end-property results.

As a further aid to the processor in this field, the bulletin outlines analytical procedures for the usual general property tests to determine color, water content, per cent of sodium sulfate and per cent active content.

For your copy of Bulletin P-148 mail the coupon today.



Polyurethane Adhesive Information Available

A bulletin recently published gives the latest information obtained from application research on using polyurethanes as adhesives for bonding rigid materials, such as metal-to-metal or glass-to-glass.

Polyurethanes are prepared by reacting a polyfunctional hydroxyl compound with an excess of Monsanto diisocyanates. The bulletin lists the various raw materials and chemical reactions of this adhesive system. Other details on bond strength, curing, etc. also given. Send coupon for your copy of bulletin P-151.



*Reg. U. S. Pat. Off.

.....

MONSANTO CHEMICAL COMPANY 12/53
1702 South Second Street, St. Louis 4, Missouri

Please send information on: ☐ Chloramine-T

Please send:

<input type="checkbox"/> Actamer Bulletin	<input type="checkbox"/> PY-RAN Brochure
<input type="checkbox"/> Benthal Bulletin	<input type="checkbox"/> Alkyl Benzene Bulletin P-148
<input type="checkbox"/> Phenol Handling Booklet	<input type="checkbox"/> Polyurethane Bulletin P-151

Name..... Title.....
Company.....
Street.....
City..... Zone..... State.....

.....

When inquiring check CP 5168 on handy form, pgs. 2-3

MATERIALS

via an aqueous process in which minute particles of high purity silica are formed. Granulation is accomplished without the use of binders.

(Products of the Grasselli Chemicals Department of E. I. du Pont de Nemours & Company (Inc.), Dept. CP, Wilmington 98, Delaware . . . or for more information on manufacturer's product, reader may simply check CP 5169 on handy Reader Service slip located between pages 2 and 3.)

Choice of surfactant speeded by dial-type selector . . .

based on HLB system, device recommends proper agent for 96 applications

Selecting proper surface active agent is speedily accomplished by using a dial-type indicator. With the great number of emulsifiers or surface active agents now available on the market, the inexperienced — and even the experienced — technologist is often faced with the prospect of innumerable trials in order to determine which agent is best suited to his needs.

One of the most important properties of a surface active agent is relative strength of the hydrophilic (water attracting) components of its molecules to the lipophilic (oil attracting) components. A method has been devised for expressing this relative strength numerically so its value for a blend of emulsifying agents is sum of values of its constituents in proportions in which these constituents are used. Numerical value is termed "hydrophile-lipophile balance", abbreviated HLB.

Selector is based on this system. Each surfactant has been assigned an empirical number representing its HLB. Common applications of these agents have also been assigned HLB numbers. For example, all surfactants which are acceptable as detergents have an HLB value of 13 to 15, water-oil emulsifiers a range of 3 to 5.

Printed on durable card stock, device measures $10\frac{7}{8} \times 6\frac{3}{4}$ ", and offers recommended formulations for 96 different and specific problems. Formulas chosen for use on selector are typical basic formulas, and may therefore be used in solving numerous other problems. Applications covered on twin dials include cosmetic problems, pharmaceuticals, detergents, agricultural chemicals, textile chemicals, and miscellaneous industrial formulations.

For most applications, device indicates one specific emulsifier. When a blend is recommended, user can turn to back of selector and calculate percentage of each emulsifier in blend by means of specially designed calculating device. Full directions for use are printed on selector.

(HLB Surfactant Selector may be obtained from Industrial Chemicals Department, Atlas Powder Company, Department CP, Wilmington 99, Delaware . . . or for more information on manufacturer's product reader may check CP 5170 on handy Reader Service slip located between pages two and three.)



Dependable Source of Chemical Raw Materials



The Philip Carey Company, Cincinnati, Ohio, sprays whiter-than-white coating on Ceramo siding in an automatic machine (top and left). Coated shingles (insert, lower left) entering baking ovens.

How Wyandotte Purecal helps make world's whitest Ceramic Siding

Ceramo, used as sidewalls in a new or old home, is the miracle material of the building industry. It won't burn, rot, warp, crack, or curl, and washing with ordinary soap and water keeps it looking sparkling white, year after year.

Ceramo is an exclusive product of The Philip Carey Manufacturing Co., Cincinnati, Ohio.

It is a ceramic-glazed, asbestos-cement siding of unusual whiteness. In fact, light reflectivity tests, recommended by U.S. Bureau of Standards, rate Ceramo 90.7%. Published figures rate lead zinc white paint, 2 coats — 66% . . . titanium oxide white paint — 75%.

To get a lasting white finish, requires

not only highest quality ingredients but also a white-white extender and a practically permanent coloring agent. Wyandotte PURECAL* is both! PURECAL is Wyandotte's precipitated calcium carbonate — the whitest pigment extender known . . . completely free from the metallic impurities that cause discoloration upon aging.

This manufacturer's experience has been that Wyandotte PURECAL serves both these prime purposes more economically than any other ingredient of comparable quality.

How about your business? Can you profit from PURECAL as an extender in paint, paper, rubber, or in your new products? Write Wyandotte for free

samples and data. State your requirements—our Research Department may have valuable data for you. *Wyandotte Chemicals Corporation, Wyandotte Michigan. Offices in principal cities*
*Reg. U.S. Pat. Off.



HEADQUARTERS FOR ALKALIES

Soda Ash • Caustic Soda • Bicarbonate of Soda • Chlorine
Calcium Carbonate • Calcium Chloride • Glycols • Synthetic
Detergents • Agricultural Insecticides • Soil Conditioners
Other Organic and Inorganic Chemicals

MATERIALS

Recommend fungicide for tank-mix formulations

Uses: Ziram-type fungicide for use in tank mix formulations. Recommended for use on all crops where dithiocarbamate fungicides are now being used . . . early blight on potatoes; early blight, anthracnose, and septoria on tomatoes; leaf spots on celery; leaf diseases and anthracnose on cucurbits; rusts and anthracnose on beans; and leaf diseases on onions.

Features: Fungicide's effectiveness has been thoroughly tested in Ohio, Indiana, Colorado, and Florida.

Description: Good-rite SDD is a liquid, containing one pound of active material per quart. It is supplied as a water solution containing 40% sodium dimethyl dithiocarbamate plus additives. It is soluble in water to all proportions and shows no deterioration on storage or damage on freezing. Fungicide is non-flammable, alkaline, and compatible with most commonly used insecticides.

Formulation and application are as follows: One quart SDD plus 1 pound crystalline $ZnSO_4$ per 100 gallons water. Add SDD to half filled spray tank, dissolve $ZnSO_4$ and add to spray tank with agitation.

(Product of the B. F. Goodrich Chemical Company, Dept. CP, Rose Building, 2060 East Ninth Street, Cleveland 15, Ohio . . . or for more information check CP 5172 on handy form, pages 2 & 3.)

Offer commercial quantities of dialkyl alkylphosphonates for first time

A series of dialkyl alkylphosphonates is the latest addition to this manufacturer's family of stable organic phosphorous compounds. Available for the first time in commercial quantities, it is reported, are: diethyl ethylphosphonate, dibutyl butylphosphonate, and bis (2-ethylhexyl) 2-ethylhexylphosphonate. Materials are neutral esters of phosphonic acids and are clear, colorless, mobile liquids with very mild characteristics.

New series is similar in many respects to the trialkyl phosphates announced just a short time ago and which have been adapted to a variety of industrial applications. Significant structural difference between the two is that the phosphonates have one alkyl radical attached directly to the phosphorous atom by a carbon-phosphorous bond. Investigations indicate that this structural difference affords the phosphonates distinct advantages over the phosphates — among these are higher flash points, lower toxicity, and greater thermal stability.

Applications, properties, uses, and other pertinent technical data on the dialkyl alkylphosphonates are available in a brochure by the same name — "Dialkyl Alkylphosphonates" — available from this manufacturer. In addition, research samples are also offered. Merely a summary of physical properties will be presented here for the sake of brevity:

When inquiring check CP 5171 on handy form, pgs. 2-3

MATERIALS

Dialkyl Alkylphosphonates

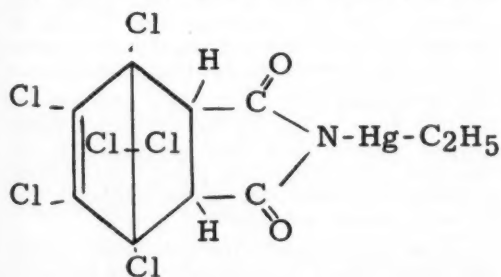
	DEEP	DBBP	EHEHP
Boiling Point, °C	82-83 @11 mm	127-128 @2.5 mm	160-161 @0.25 mm
Specific Gravity, 20/4°	1.025	0.948	0.908
Refractive Index, n ₂₀ /D	1.4148	1.4310	1.4481
Flash Point (COC), °C	105	155	215
Fire Point (COC), °C	120	180	240
Thermal Stability	good	good	good
Acidity	neutral	neutral	neutral
Solubility in:			
Water	soluble	insoluble	insoluble
Heavy mineral oil	insoluble	soluble	soluble
Other solvents	Miscible with acetone, alcohol, benzene, carbon tetrachloride, ether, heptane kerosene, and most common organic solvents.		

(Products of the Virginia-Carolina Chemical Corporation, Dept. CP, 401 East Main Street, Richmond, Virginia . . . or check CP 5173 on handy form between pages 2 and 3.)

Field tests are uncovering worth of organo-mercury fungicide

Experimental work is turning up a new fungicide for dip treatment of gladiolus corms and, quite possibly, as a seed treatment for cucurbits and cereals and foliar spray for pecans. Field tests show it to be highly effective for controlling Bacterial Scab and Fusarium Rots without corm injury. The fungicide is also effective against Sclerotinia Rot and Bacterial Blight.

Given the coined name Emmi, the fungicide is a



white, crystalline, almost odorless material which melts at 190 to 192°C. Product is readily soluble, at room temperature and concentrations of 10% or more, in acetone, methyl isobutyl ketone, isophorone, and other ketonic solvents, moderately soluble in alcohols, slightly soluble in hydrocarbons, and substantially insoluble in water.

(Emmi is a development of Velsicol Corp., Division of Arvey Corp., Dept. CP, 330 E. Grand Ave., Chicago 11, Ill. . . . or check CP 5174, pages 2 & 3.)

Can You Use These Properties of

SOLVAY Anchor Brand

Trade Mark Reg. U. S. Pat. Off.

AMMONIUM BICARBONATE in Your Operations?

Physical and Chemical Properties

Molecular Weight: 79.06

Solubility in Water: 14% at 10°C., 17.4% at 20°C., and 21.3% at 30°C.—Insoluble in alcohol.

Negative heat of solution

Stability: Relatively stable at room temperatures.

Rapidly and completely volatile at 140°F and above. Rate of decomposition increases as temperature rises. The gases formed in this process are as follows:

Ammonia gas (NH ₃)	21.5%
Carbon dioxide gas (CO ₂)	55.7%
Water vapor (H ₂ O)	22.8%

pH of 1/10 N solution at 25°C.: 7.8

Appearance: White Crystals

Quality: Exceptionally pure. Food grade. Can be used as a reagent. Very low metal content.

From biscuits to plastics . . . from chrome leather processing to cold wave solutions—these are the varied fields in which Solvay "Anchor Brand" Ammonium Bicarbonate has already found important use. The properties and unusual features of this versatile product suggest many other uses; it may find application in *your* operations.

Solvay "Anchor Brand" Ammonium Bicarbonate is a safe, low cost source of ammonia and carbon dioxide. It can be used to create voids, decrease density and add bulk in plastic materials. It is an exceptionally efficient neutralizing agent, although it has an unusually low pH. It has higher neutralizing value than either borax or sodium bicarbonate—and yet a 1/10 normal solution at

25°C. has a pH of only 7.8. And—because "Anchor Brand" Ammonium Bicarbonate volatilizes completely at relatively low temperatures—it leaves no residue to affect the end product.

For samples and more detailed technical information, fill in and mail coupon.

SOLVAY PROCESS DIVISION



Allied Chemical & Dye Corporation
61 Broadway, New York 6, N. Y.

I am interested in the possible use of Solvay "Anchor Brand" Ammonium Bicarbonate in my operations. Please send me, without cost or obligation, samples and further technical information.

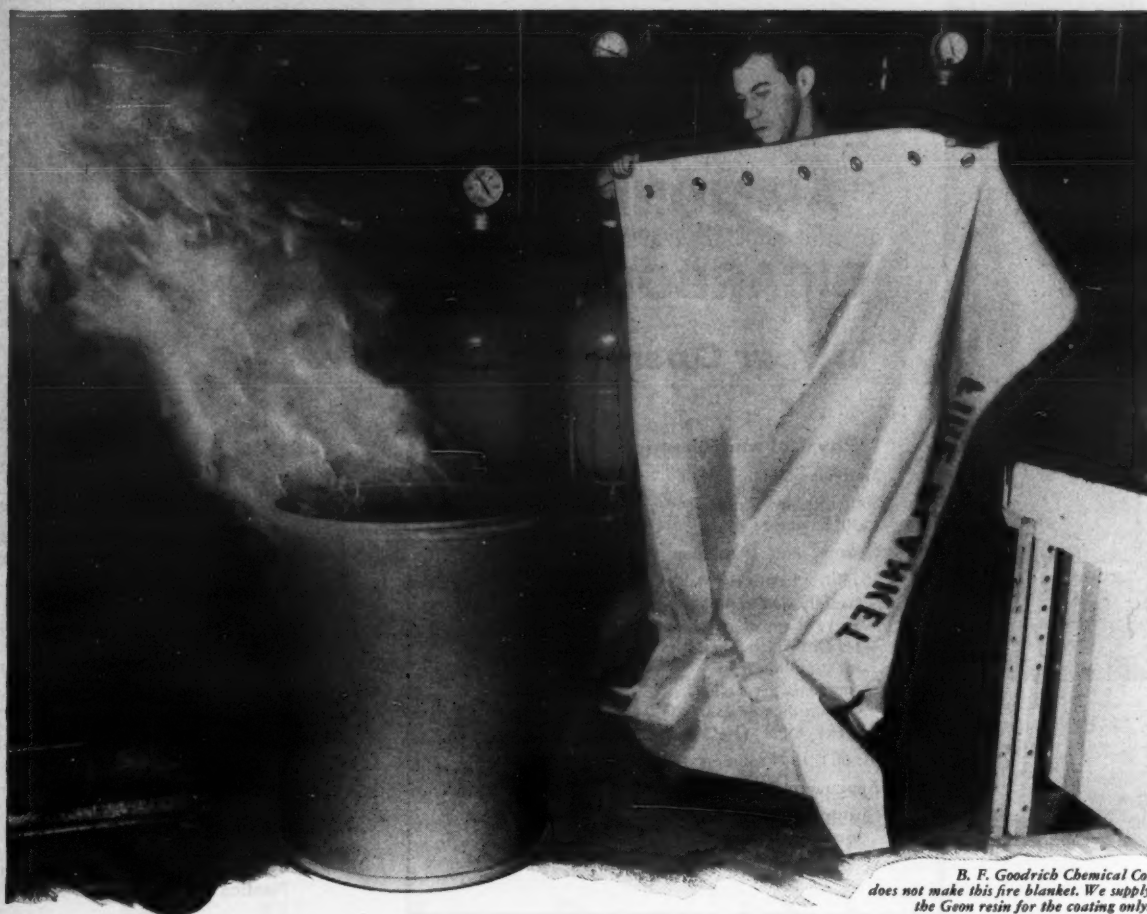
NAME _____
COMPANY _____
ADDRESS _____
CITY _____ ZONE _____ STATE _____ AM-12

Soda Ash • Caustic Soda • Potassium Carbonate • Calcium Chloride • Chlorine • Caustic Potash • Sodium Nitrite
Cleaning Compounds • Ammonium Bicarbonate • Sodium Bicarbonate • Snowflake® Crystals • Monochlorobenzene
Para-dichlorobenzene • Ortho-dichlorobenzene
Ammonium Chloride

When inquiring check CP 5175 on handy form, pgs. 2-3

Another new development using

B. F. Goodrich Chemical raw materials



B. F. Goodrich Chemical Co. does not make this fire blanket. We supply the Geon resin for the coating only.

Special Blanket Smothers Fire!

THROW this new type, glass cloth blanket coated with vinyl plastic over a fire—and out goes the flame! The blanket cuts off the oxygen, smothering the fire. An invaluable aid in emergencies to help protect human life and small industrial equipment.

That's the big advantage. Here are more. The strong glass cloth is given added strength, durability and weather protection by a coating of a plastic compound made from a Geon vinyl resin. The blanket can be hung any-

where, indoors or out—needs no covering against sun or rain.

And Geon provides resistance to acids, alkalis, most solvents and other chemicals, stays flexible below zero, will not support combustion. The plastic surface can be kept clean merely by flushing with water or wiping with a damp cloth.

Geon materials offer a host of advantages that help improve or develop more saleable products. We'll help you select the one best suited to your needs. For technical infor-

mation, please write Dept. GF-6, B. F. Goodrich Chemical Company, Rose Building, Cleveland 15, Ohio. Cable address: Goodchemco. In Canada: Kitchener, Ontario.



GEON RESINS • GOOD-RITE PLASTICIZERS . . . the ideal team to make products easier, better and more saleable.

GEON polyvinyl materials • HYCAR American rubber • GOOD-RITE chemicals and plasticizers • HARMON colors

When inquiring check CP 5176 on handy form, pgs. 2-3

MATERIALS

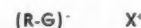
"Low Cross Linked Resins — A New Tool in Chemistry and Industry"

The chemist is always in need of new analytical methods in order to simplify his work, to make possible quantitative measurements at various points of his investigations, as well as a means of controlling various processes and the purity of products. A new tool for analytical work has been found in the low cross linked polystyrene resins, which are made to act as ion exchange materials through the incorporation of some specific ionic groups into the structure of the resin.

These solid ion exchangers are complex organic materials composed of a matrix to which is attached a group capable of existing in ionic state, thus making these materials solid electrolytes. There are two types of ion exchangers depending on whether the attached group carries a positive or negative charge when in an ionized state. This is best illustrated if the above is written symbolically. Let R be the organic complex, G the active group attached to R, and X some positive or negative ion attached to G so that the formula for an ion exchanger may be written as:



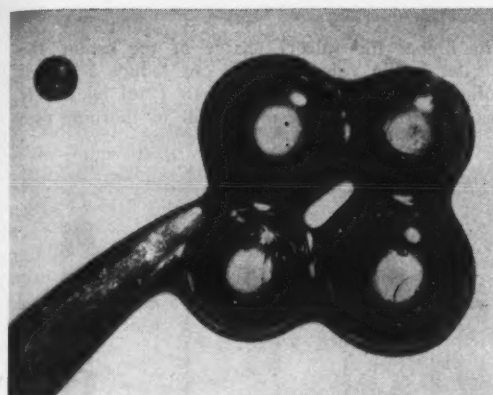
A cation exchanger would be a resin of the following ionic structure



where the main body of the resin carries a negative charge and X is positive. The latter may be hydrogen, sodium, potassium, calcium, etc. An anion exchanger is one in which (R-G) is a positive constituent, or (R-G)⁺, and X is negative. The most-negative common ions are chloride, sulfate, and carbonate. The R-G components remain always as the solid part of the resin and only the X component can be changed at will through proper reactions.

The introduction of the GX into a resin converts the resin from an inactive material into a highly dynamic system. These ionic components in the solid resins give them certain physical and chemical properties which make them unique and highly useful to the chemist and industry in general.

As a new analytical tool, these resins work through their volume change characteristics. When dry beads of a polystyrene cation exchanger are placed in water, they swell, the degree of which depends on the constituents in the matrix of the polymer, the R portion, as well as on the ionic groups, or the G and X components. The lower the quality of cross linking agent used in making the R component, the higher is the swelling of the ion exchanger. Thus, when 1% divinylbenzene is used as the cross linking agent, the dry beads swell 25 times their original volume. When 0.25% is used, swellings as high as 60 fold are obtained.



Dry resin particles (upper left), smaller than the head of a pin, when placed in water swell 25 to 50 times their original size (four are grouped together and pointed out with the point of a pin in this photograph)

This swelling is due to the fact that the solid resin in water acts as a concentrated solution which is in contact with dilute solution, namely water. From certain energy relations, we know that water has to go into the more concentrated solution and in this case it is the solid resin. This results in a swelling of the resin. The flow of water from a dilute solution to a more concentrated solution may be compared to the flow of water from a higher level to a lower level, or the flow of heat from a body of higher temperature to one of lower temperature.

If the water outside the resin is now replaced with a solution containing a strong electrolyte, such as salt or acids, the resinous exchanger shrinks due to the fact that the difference in the concentration between the solution outside the resin and the resin itself becomes smaller, so that water leaves the solid material. The amount of shrinkage depends on the concentration of the solution outside the resin; the higher the concentration of the solution, the greater the shrinkage.

From the above we can see that the volume of such a resin is an indicator of the concentration of the outside ionic solution. By standardizing a resin volume for various concentrations of a given salt, and by determining the volume of a particular bed of resin in contact with a solution of unknown concentration, one can easily determine the concentration of the unknown solutions.

These resins are also affected by organic solvents such as alcohols and acetone. The volume depends on the quantity of water present in the organic solvent, thus making the resin an indicator of the concentration of the organic solvent.

The degree of shrinkage of the resins also depends on the strength of the electrolyte in contact with them; the stronger the electrolyte, the greater the shrinkage for a given concentration.

Another interesting factor is that the volume of the resin depends on the type of cation (X) attached to the ionic group of the resin, i.e. G component.

(Continued on next page)

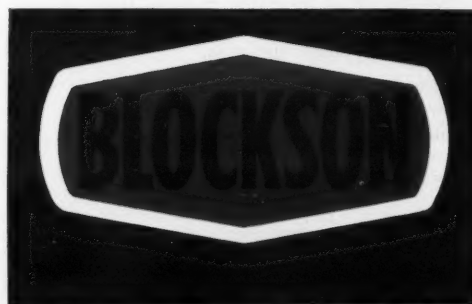
Trisodium Phosphate
CRYSTALLINE
MONOHYDRATE

Sodium Tripolyphosphate

Tetrasodium Pyrophosphate

Sodium Polyphos

Sodium Polyphos is Blockson's brand name for a water soluble Glassy Sodium Phosphate with the desirable characteristics of Sodium Hexametaphosphate and Sodium Tetraphosphate.



BLOCKSON IS ALSO A MAJOR PRODUCER OF:		SODIUM ACID PYROPHOSPHATE
SODIUM SILICOFLOURIDE		CHLORINATED TRISODIUM PHOSPHATE
SODIUM FLUORIDE		DISODIUM PHOSPHATE Anhydrous • Crystalline
HYGRADE FERTILIZER		MONOSODIUM PHOSPHATE Anhydrous • Monohydrate

BLOCKSON CHEMICAL COMPANY • JOLIET, ILLINOIS

When inquiring check CP 5177 on handy form, pgs. 2-3

AT THE FRONTIERS OF PROGRESS YOU'LL FIND

AN
AIR REDUCTION
PRODUCT

the
magic
of
CO₂

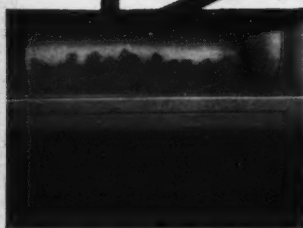
... in rubber
tumbling

Cutting, trimming and burnishing molded articles at lower cost

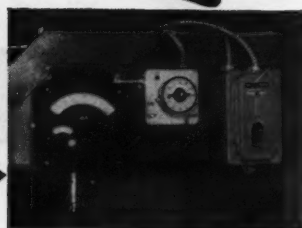
CO₂—in meeting varying requirements and solving diverse problems for industry is nothing less than miraculous. Take rubber tumbling, for example. Here, CO₂ as "DRY-ICE" or a liquid, is fast replacing an outmoded method of trimming excess rubber squeezed out by the molding process. Formerly, these small rubber articles were cut, trimmed and burnished by hand—a time-consuming, expensive finishing operation. Today, CO₂ does the job in quantity better, faster and cheaper.

CO₂ in its three forms—gas, liquid, solid—is used more and more by industry as refrigerant, chemical, inert gas, pressure medium, carbonation agent. CO₂ offers a unique combination of properties—often, two or more of these properties can be employed in a single operation.

Write for additional information about low cost, convenient, adaptable CO₂ for rubber freezing and countless other uses.



Interior view of tumbler with parts. Note dome to right which houses thermostat control.



Modern tumbling equipment features automatic controls with thermostatic regulators and electric timers.

MATERIALS

(Continued from preceding page)

The higher the valence charge of the cation, the smaller is the volume. One can reduce a 10 ml volume of wet resin to less than 1 ml by merely changing the cation from sodium to thorium (see

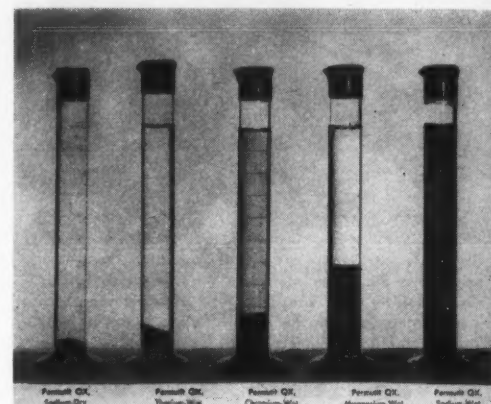


illustration). Sodium carries a positive charge of one, while thorium has a charge of four. The resin prefers the higher charged ions. This makes it possible to separate certain ions, as well as to determine the break-through of ions of higher valence. These resins may be used, therefore, as indicators of the end point of various reactions which depend on the charge of the cations or charge in the ionic concentration of reactants.

Since the G group of a resin can be varied also, there are many possibilities of preparing resins with various swelling characteristics.

The volume of the resin may be measured in graduated glass tubes or by determining the diameter of a single bead microscopically. The use of single beads will help in the analysis of very small amounts of solution.

The ion exchange resins as a whole are very important materials for water conditioning and many chemical processes. They are used not only to soften water, but also they are applied to streptomycin purification, recovery of valuable minerals, and the separation of various components from atomic piles. These materials are also being used for biological studies such as antibody purification and blood stabilization. As medicinals, we find them being used for the removal of sodium in cases of edema and acid removal in cases of hyperacidity.

As the chemist learns more about these resins, he is asked by many research men for resins with specific properties or special groups to perform specific actions. The tendency, therefore, is to make these resins specific for each particular problem. A new type of exchanger is appearing in the laboratory, called group exchangers. These are capable of reacting with non-ionic materials. If one has an imagination, one can speculate about the potentialities of these exchangers in the future.

Many body tissues have ion exchange properties. Also, many components in body fluids are capable of being adsorbed or removed by ion exchangers or group

PURECO

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A DIVISION OF AIR REDUCTION COMPANY, INCORPORATED

When inquiring check CP 5178 on handy form, pgs. 2-3

exchangers. The passage of body fluids through special filters of specific exchangers for the purpose of removal of undesirable poisons may be a reality in the near future. The knowledge gained from the study of the synthetic exchangers will help scientists to understand better the laws governing exchangers in the human body.

Another application of highly swelling synthetic resins having exchange characteristics will be for water and nutrient retention in soils. Water retention is important in localities where water comes down in torrents in short intervals. These resins, by virtue of their swelling, could keep the soil from packing and also prevent the run down of water too rapidly.

It is interesting to note that ion exchange materials and some of their properties were first discovered through the study of soils by English chemists about 100 years ago. They showed that the mineral nutrients in soils go through exchange reactions with active groups in soils. Better understanding of ion exchange reactions and ion exchangers will also revolutionize agriculture not only because of greater knowledge of soils and plant nutrition, but also because ion exchanges will make possible the conversion of sea water and brackish waters for irrigation purposes.

("Low Cross Linked Resin — A New Tool in Chemistry and Industry" by Dr. C. Calmon, Chief Research Chemist, The Permutit Company, 330 West 42nd Street, New York 36, New York.)

**Save 25% in materials
by dry blending
own vinyls . . .**

compounds for injection molding show high degree of heat stability

A line of heat-stable vinyl molding compounds is currently available that is adaptable to easy dry blending and offers molders a saving in material costs of as much as 25%. Opalon 300 vinyl resins are recommended for dry blending in the production of extruded compounds, thus eliminating the need for expensive mixing and milling.

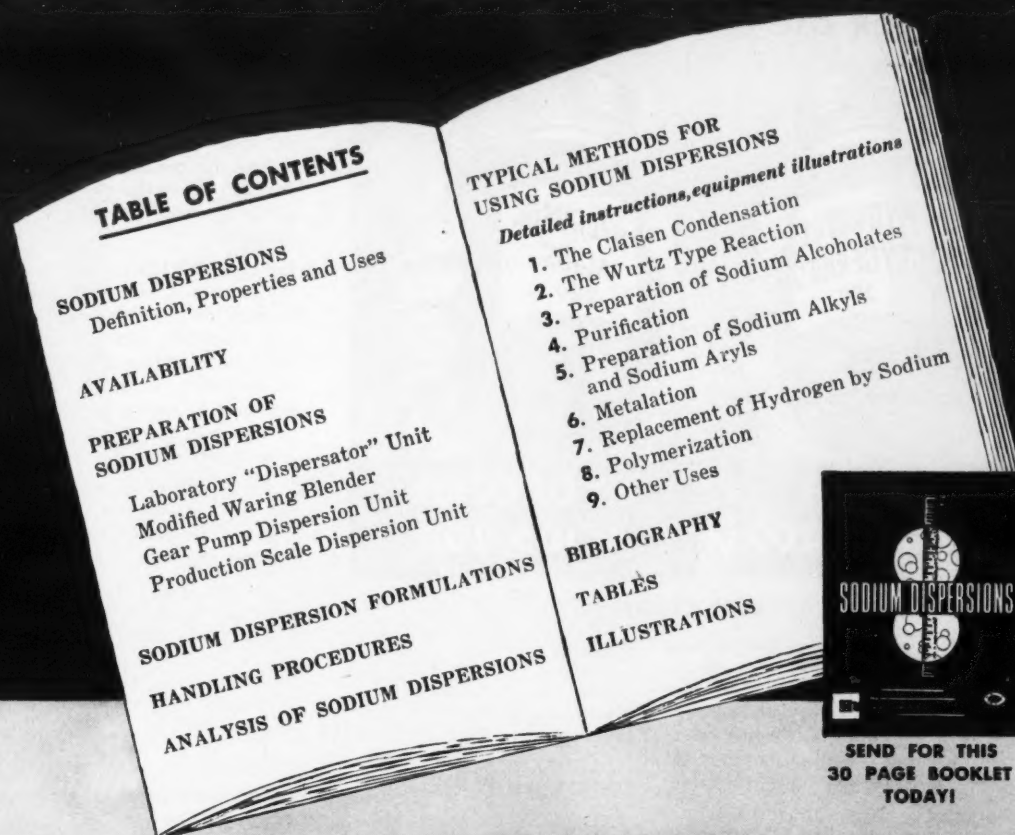
Although 8 standard blends are available, those who do their own dry blending can realize a 25% saving in material. The blends contain plasticizer, filler, stabilizer, and lubricant. Proportions can be varied to produce a wide range of properties in the finished moldings. Compounds themselves are dry, free-flowing, dustless powders supplied in natural, black, or white. They may be drum-tumbled with dry pigment to produce a range of colors.

Items molded from these vinyls include doll heads, grommets, arm rest covers, cord plugs, goggles, welings, coasters, fly swatters, bumpers, drain trays, handle grips, and hair curlers.

(Opalon 300 vinyl resins are products of the Plastics Division of the Monsanto Chemical Company, Dept. CP, Springfield, Massachusetts . . . or for more information check CP 5179, pages 2 and 3.)

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SODIUM DISPERSIONS



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Sodium dispersions are stable suspensions of microscopic sodium particles in inert hydrocarbon media. They provide ease of handling under controlled conditions at temperatures both above and below the melting point of sodium (97.5°C.).

In many cases, sodium dispersions may be substituted for expensive alkaline reagents, such as sodium alkoxides, sodamide or sodium hydride. Since reaction conditions are easily controlled, yields are increased and reaction times and temperatures are lowered.

Whether you are in research or production, you should know how sodium dispersions are leading to many new industrial uses for this versatile chemical. This new booklet covers developments over the past three years. A copy is yours for the asking.



Metallic Sodium is manufactured by
National Distillers Chemical Co.
at Ashtabula, Ohio and sold by:

INDUSTRIAL CHEMICALS CO.

Divisions of National Distillers Products Corporation

120 Broadway, New York 5, New York

Branches in all principal cities.



When inquiring check CP 5180 on handy form, pgs. 2-3

for: high Hydroxyl content...
high melting point...
light color...

try high quality

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CASTOR OIL OR STEARIC ACID



SPECIFICATIONS

86-88 Melting Point (°C)	
70-74 Titre (°C)	70-74
4 Max. Acid Number	172-182
177-181 Saponification Value	182-187
3 Max. Iodine Value	4 Max.
135 Min. Hydroxyl Value	147 Min.
138 Min. Acetyl Value	133 Min.

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When inquiring check CP 5181 on handy form, pgs. 2-3

MATERIALS

Powder form responsible for hydroxyethyl cellulose's fast dissolving

An easily dissolved form of maker's Cellosize hydroxyethyl cellulose is now commercially available in the form of a white, water-soluble, free-flowing powder. Product is useful as a thickener, stabilizer, dispersant, and binder, and is being offered in two viscosity types — Cellosize WPHS (viscosity of a 5% solution is about 7000 cps @ 20°C), and Cellosize WPHS-Low (viscosity of a 5% solution is approximately 100 cps @ 20°C). Both types contain a minimum of 60% hydroxyethyl cellulose and have a maximum salt content (sodium phosphates) of 35%. The salt content of the powder form makes the product dissolve more easily in water. In many cases the presence of phosphate salts will advantageously impart detergent and dispersant properties.

Cellosize WPHS has already proven of value as a thickener and stabilizer for resin emulsions, as a laundry size, and as a thickener for cosmetic lotions and water-base inks. It is being used as an additive in urea-formaldehyde textile finishes to improve hand of the fabric, as an additive in dressings for rubber products to impart a glossy finish, as a constituent of non-staining wallpaper adhesives, and as a leather pasting adhesive.

Cellosize WPHS-Low is also suggested as a soil suspending agent and thickener for detergents, as a pigment dispersant, as an adhesive, and a general-purpose thickener.

(Announced by Carbide and Carbon Chemicals Company, a Division of Union Carbide and Carbon Corporation, Dept. CP, 30 E. 42nd St., New York 17, N. Y. . . . or for more information check CP 5182 on handy form, pages 2 and 3.)

Offer experimental quantities of methylstyrene

Experimental quantities of methylstyrene are currently available for investigative work in rendering plastics and resins more heat resistant. Being produced only on a pilot plant scale at maker's Stamford, Connecticut, research laboratories, the commercial manufacturing facilities would call for a petrochemical type operation in which toluene would be reacted with acetylene. The product derived from this reaction would be then subjected to catalytic cracking to produce methylstyrene.

Polymers produced from methylstyrene have shown significant properties in a number of applications. These include injection molding compounds, surface coating resins, and low-pressure laminating compounds of greater heat resistance. These polymers, used as injection molding compounds, are expected to find the same wide range of applications as polystyrenes.

(Methylstyrene is a product of the American Cyanamid Company, Dept. CP, 30 Rockefeller Plaza, New York 20, New York . . . or for more information check CP 5183 on handy form, pages 2 and 3.)

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Title

Company

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City..... Zone..... State.....

When inquiring check CP 5184 on handy form, pgs. 2-3

CHEMICAL PROCESSING

MATERIALS

Commercial quantities — iso-octyl thioglycolate

Uses: Recommended for use in plasticizers, antioxidants, fungicides, oil additives, polymerization modifiers, insecticides, and stabilizers.

Features: Available in commercial quantities as a mixture of isomeric C₈ primary alcohols.

Description: Iso-octyl thioglycolate is prepared by vacuum distillation of thioglycolic acid and an iso-octyl alcohol.

(Product of Evans Chemetics, Incorporated, Dept. CP, 250 East 43rd Street, New York 17, New York . . . or for more information on manufacturer's product, reader may simply check CP 5185 on handy Reader Service slip, pages 2 and 3.)

Methanol, methyl acetate being blended to form versatile solvent

Tank car lots of a high-ester solvent, reported to be low in cost, are currently available. Known as Methac, product is a blend of methyl acetate and methanol and is said to be a powerful solvent, thinner, or cleaner in the following applications: *cutting nitrocellulose lacquers, lacquer thinners; shoe cements, thinners, and cleaners; paint removers and wash solvents; extracting solvent for perfumes; and fabric and paper coatings.*

Addition of acetone will convert Methac to methyl acetone, and distillation will separate the blend into 82% methyl acetate azeotrope and pure methanol. Specifications set up are: 7.4 lb/gal, 60% by weight (min) methyl acetate and balance methanol, and 55-65°C boiling range.

(Manufacturer is American Monomer Corporation, Dept. CP, Leominster, Massachusetts . . . or for more information reader may simply check CP 5186 on the convenient Reader Service slip located between pages two and three.)

For more information on product at right, specify CP 5187 . . . see information request blank between pages 2 - 3.



Constant control of quality

Quality control is a continuous job. It is carried out with modern equipment and painstaking attention to detail in every phase of the production of Nialk chemicals.

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NIALK CAUSTIC POTASH: The controlled quality and uniformity of NIALK Caustic Potash and NIALK Carbonate of Potash contribute importantly to the satisfactory performance of many highly sensitive photographic baths.

Every step in the production of these NIALK products is rigidly controlled to give absolute satisfaction in many types of applications.

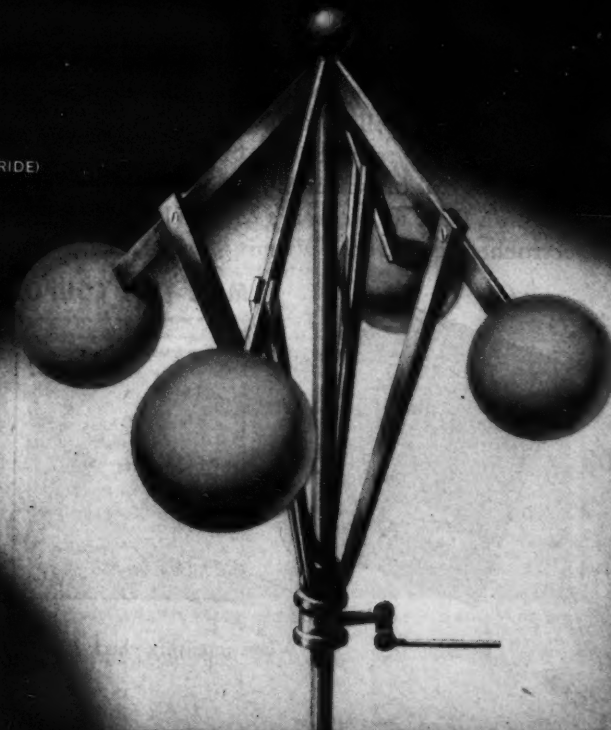
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CAUSTIC POTASH
CARBONATE OF POTASH
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CAUSTIC SODA
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EMULSIFIERS

THICKENERS

Here are a few of the many profitable applications already found for versatile "Elvanol"—a water-soluble, thermoplastic resin. By putting the valuable properties of "Elvanol" to work, many manufacturers have made important improvements in their products or processing techniques.

So that you may see what "Elvanol" can do for your product, we offer you—free—a 44-page book fully describing its properties and applications. And if the many possibilities of "Elvanol" suggest some profitable applications to you, we will be glad to provide you with a working sample. No obligation, of course. Just call or write to:

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Electrochemicals Dept., Wilmington 98, Del.



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Put these properties of "Elvanol" to work for you:

WATER-SOLUBLE—dissolves easily in water, eliminating need for expensive organic solvents.

RESISTANT TO OILS, GREASE, SOLVENTS—unaffected by contact with vegetable oils, greases and petroleum hydrocarbons. High degree of impermeability to such gases as oxygen, nitrogen, hydrogen, and carbon monoxide.

STRONG AND FLEXIBLE—resists tearing and abrasion. Stable to sunlight and artificial light. Properties may be varied with plasticizers.

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AVAILABLE IN SEVERAL GRADES—each with different physical properties to meet various industrial requirements. Let us know what specific application you have in mind, and we will be glad to help you develop suitable formulations.



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- ☐ Oil and Grease Resistant Papers
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- ☐ Emulsifier Thickeners

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CP-123

Please send me your free book containing full information about Du Pont "Elvanol" polyvinyl alcohols.

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MATERIALS

"Selected Values of Properties of Hydrocarbons"

Prepared principally for use by research workers in the petroleum, rubber, and chemical industries, "Selected Values of Properties of Hydrocarbons" contains numerous tables of physical and thermodynamic properties of hydrocarbons compiled through joint investigations of the National Bureau of Standards and the American Petroleum Institute.

Critically selected properties of the various hydrocarbons include boiling points and pressure coefficients, refractive indexes, densities and specific gravities, freezing points, molecular volumes, vapor pressures, heat capacities, heats of transition, etc.

Originally issued in 1947, a limited number of copies are still available by remitting \$3.25 direct to the Superintendent of Documents, Government Printing Office, Washington 25, District of Columbia.

Rounds out line of metal processing specialties

The Fosbond line of phosphate coatings and metal processing chemicals is now completely rounded out with the addition of an extensive line of chemical specialties for phosphatizing metals for corrosion resistance and paint bonding.

New Fosbond line includes phosphating compounds for application of various types of iron, zinc, or magnesium phosphate coatings. Included are compounds for surface preparation prior to phosphating. In one series of these products, the cleaning and phosphatizing actions are combined, thus eliminating one step in the cycle. Other cycles have been arranged to provide coatings of minimum weight, yet uniform and very fine grained in order to give the metal maximum corrosion resistance and paint bonding action, as well as a very smooth painted surface.

(Fosbond line is a product of the Pennsylvania Salt Manufacturing Company, Dept. CP, 1000 Widener Building, Philadelphia 7, Pennsylvania . . . or for more information check CP 5189 on handy form, pages 2 and 3.)

Removes trace metals in textile processing

Just announced is full-scale production of ethylenediamine tetraacetic acid and its salts by manufacturer. This series of products has proven to be the top development of recent years in the containment of trace metal impurities in industries where such impurities have been troublesome. Series is being produced under the name Tetrine at maker's Williamsport, Pennsylvania, plant.

Textile processing and dyeing, soap and synthetic detergents, metal cleaning and plating, agriculture,

When inquiring check CP 5188 on handy form, pgs. 2-3

cosmetics, leather, and germicides are calling for EDTA and its salts. For example, when used in the dyeing of textiles, the presence of a small percentage of a Tetrine is said to produce brighter, cleaner, uniform shades with more overall economy. Liquid soaps and shampoos can also make use of these same advantages.

Products are stable and function efficiently in highly acid, neutral, and strongly alkaline solutions. They function by complexing or sequestering the trace metal impurity so that it is rendered harmless under processing conditions.

(Manufacturer is Glyco Products Company, Incorporated, Dept. CP, 26 Court Street, Brooklyn 1, New York . . . or for more information check CP 5190 on the convenient Reader Service slip between pages 2 and 3.)

Practically eliminates need for foam killers in many paper mills . . .

synthetic engine size improves foam condition from beater to machine

An attack on the foaming problem that has plagued paper mills has been announced — a low foaming synthetic engine size for paper products. A member of the Mersize family, the product is reported to have a drastically lowered foam index, while still retaining a high size efficiency.

Mill tests have shown that the low-foaming product will improve foam conditions from the beater to the machine, also to foam spots in the paper. Manufacturer goes so far as to say that the product will reduce, if not eliminate, the need for foam killers in many mills.

(Low-foaming Mersize is a product of the Merrimac Division of the Monsanto Chemical Company, Dept. CP, Everett, Massachusetts . . . or for more information reader may simply check CP 5191 on handy Reader Service slip located between pages two and three.)

17 x 27" wall chart lists 40 fat-derived chemicals

A new wall chart of industrial chemicals derived from oils and fats is currently available. Measuring 17 x 27", the chart covers composition and specifications of all the standard Chemi-Fats produced by this concern: 7 Adol Fatty Alcohols, 10 Hydrofol Glycerides, 14 Hydrofol Fatty Acids, and 9 Sperm Oil products.

Shown on the chart in alphabetical sequence are common applications for the fat chemicals. Chart is issued by the Chemical Product Division of the Archer-Daniels-Midland Company, Dept. CP, 2191 West 110th Street, Cleveland 2, Ohio. When inquiring specify CP 5192 on handy form, pages 2 and 3.

AT YOUR END OF THE COAL CHEMICAL PIPELINE . . .



NEW Magic Bullets for Murdering Microbes

Coal chemicals are the steadfast allies of the medical scientist in his uphill conquest of disease. Pyridine, for example, is vital in the manufacture of sulfa drugs. And gamma-picoline, another valuable Pittsburgh coal chemical, is the source of isonicotinic acid hydrazide, the drug which has shown bright promise in the experimental treatment of tuberculosis in recent months.

Because we control every step in the production of these coal chemicals—from coal to finished chemicals—we're able to provide the medical and pharmaceutical fields with products of exceptional high quality and purity. This same assurance of quality extends through the closely integrated production of our entire Neville Island plant.

Whether you need coal chemicals, agricultural chemicals, dyestuffs, or the products of any of our other divisions, you'll find Pittsburgh Coke & Chemical a reliable source . . . because we're basic.

Alkyl methyl pyridinium chloride
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alpha-Picoline beta, gamma-Picoline
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Pyridine Sodium Cyanide
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When inquiring check CP 5193 on handy form, pgs. 2-3



PHENOLINE 300

Protects New Concrete, Resurfaces, Repairs Old Corroded Concrete

Phenoline 300 adheres to any neutral or alkaline surface—concrete, transite, stone—without a primer. Mixed with silica-filler, it trowels in any thickness to a non-slip surface. Applied by brush or spray, it finishes to a smooth, easy-to-clean surface. Powerful bond is unaffected by light traffic, time or temperature.

Highly Resistant to Acids, Solvents, Salts and Caustics at Normal and Elevated Temperatures

Does Not Crack or Spall

Extremely Hard and Wear Resistant

Does Not Soften or Crack Under Heat

Makes Non-Skid Floors

Bulletin A-50 gives you the details on how you can corrosion-proof your concrete. Write for it today.

P1



When inquiring check CP 5194 on handy form, pgs. 2-3

WILLIAMS
announces
new line of
natural iron
oxide pigments



VVF pigments are produced by our unique grinding process to give a very, very, fine product controlled for top particle size and particle size distribution. VVF pigments will reduce your grinding and dispersing time in paints and allied products as much as 75%.

VVF pigments give you brighter mass color, stronger tint, increased hiding power, and

higher gloss than standard grind pigments.

VVF pigments now available are—Raw and Burnt Siennas, Raw and Burnt Umbers, Metallic Browns, Red Iron Oxide, and Primer Pigments.

Your Williams representatives will gladly give you complete information on this new pigment group—or mail coupon for illustrated VVF TECH REPORT.

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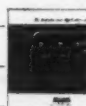
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Please send me VVF TECH REPORT giving physical and chemical specifications and list of suggested applications.

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When inquiring check CP 5195 on handy form, pgs. 2-3

MATERIALS

**Offer C₁₄-labeled
phenylalanine,
glycine**

Fifteen naturally occurring amino acids have been added to the list of radioactive carbon compounds available from this concern. These compounds are said to be especially useful in the study of synthesis and destruction of individual amino acids. In addition, they may be employed in estimating the concentration of specific amino acids in protein hydrolysates, protein metabolism, and in process control in food and animal feed industry.

Specific activities are high, ranging from 2 mc/mM for glycine to 9 mc/mM for phenylalanine. Thus, products arising from them will be detectable in high dilution. They are available in four package sizes from 1 to 0.01 mc/mM under regular AEC licensing procedures.

(Products of the Nuclear-Chicago, Dept. CP, 229 West Erie Street, Chicago 10, Illinois . . . or for more information check CP 5196 on handy form, pages 2 and 3.)

**Contract to produce
germ-free paper**

A contract was recently signed with the Monadnock Paper Company for the use of its germ-free process in treating all types of paper products. Permchem, to be employed in the process, is a product which kills or inhibits a wide range of disease-producing bacteria, fungi, and molds.

Paper thus far treated in the laboratory indicates that the process does not appreciably change the paper's appearance or strength. It is odorless and non-toxic to humans. Paper treated by the Permchem process indicates utilization as toilet and facial tissues, paper napkins, paper diapers, drinking cups, food containers, soda straws, surgical masks, wrapping paper, and other paper products where germ-free requirements are to be met.

(Permchem is a product of the Permchem Corporation, Dept. CP, 270 Park Avenue, New York 17, New York . . . or for more information check CP 5197 on handy form, pages 2 and 3.)

**Report maleic hydrazide
is effective control
for quack grass**

Tests made at the University of Wisconsin indicate that quack grass, a rugged and hard-to-kill weed that has cut into the profit of farmers throughout the northern US, can be chemically controlled with maleic hydrazide. The new chemical method of control permits the land to be planted within a few days after treatment.

Maleic hydrazide is actually a growth regulator, and is offered by this concern under the name MH-40, containing 40% active ingredient. No noticeable

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FATTY ACIDS**

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What do you want to know about coconut oil fatty acids? Specifications? Availability? Market information? Costs? Shipping information? How to get better processing results? Ask El Dorado.

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SINCE 1922
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311 California Street
San Francisco, Calif.

Plants in Bayonne, N. J.,
and Oakland, Calif.

When inquiring check CP 5198
on handy form, pgs. 2-3

CHEMICAL PROCESSING

soil toxicity effects have been noted through its application. Used in spray applications, no effects were noted on such crops as snap beans, sweet and field corn, soybeans, sorghum, buckwheat, red beets, and sun flowers.

(MH-40 is a product of the Naugatuck Chemical Division of the U.S. Rubber Company, Dept. CP, Rockefeller Center, New York 20, New York . . . or check CP 5199 on handy form, pages 2 and 3.)

Offering improved pigment, green and brown dyes

Three new "colorful" products have recently been announced: an improved chrome yellow pigment, a green dye concentrate, and a brown, dustless dye concentrate for bag, tissue, wrapping, board, and specialty papers.

Chrome Yellow Medium 40-4500 combines ease of processing with excellent gloss, opacity and durability. Calcocid Green G Conc. is for mint green and other shades on leather. Pheno Brown 3GXX Super Conc., Dustless provides variety of shades from rich deep brown to pastel tints when added to beater, hydropulper, mixing chest or tank, fan pump, or head box.

(All products described are made by Calco Chemical Division, American Cyanamid Company, Dept. CP, Bound Brook, N. J. . . . or for more information check CP 5200, pages 2 and 3.)

Some nitrofurans offered for the first time

Some 60 derivatives of furan, nitrofur, and hydrazine are currently being made available for research and experimental purposes. Many of these are reported to be available for the first time and represent merely a portion of 500 or more compounds synthesized by this manufacturer.

Many of the nitrofurans have displayed marked activity against bacteria, fungi, protozoa, and enzymes.

(Products of the Eaton Laboratories, subsidiary of The Norwich Pharmacal Company, Dept. CP, Norwich, New York . . . or for more information check CP 5201 on handy form, pages 2 and 3.)

Wax emulsion sizes for paper

Role of wax emulsions for paper sizing is the subject of a new 16-page technical booklet — Form PM-55. Types of wax emulsions available and information about their use in internal and surface sizing are covered. Issued by the Hercules Powder Company, Dept. CP, Wilmington, Delaware. When inquiring specify CP 5202 on handy form, pages 2 and 3.

... AND HERE ARE MORE New ANSUL Chemicals

ANSUL ETHER—H. A.

HYDROXY ANISOLE (Hydroquinone monomethyl ether)



Used in the manufacture of antioxidants and pharmaceuticals, in plasticizers, dyestuffs, and in organic syntheses.

ANSUL ETHER—D. M. B.

1,4 DIMETHOXY BENZENE (Hydroquinone dimethyl ether)



Used as a fixative in perfumes, as weathering agent in paints and plastics, in the manufacture of synthetic dyes, as a sun blocking agent in lotions and creams and in organic syntheses.

ANSUL ETHERS OF POLYGLYCOLS

ANSUL ETHER — 121

ETHYLENE GLYCOL DIMETHYL ETHER
 $\text{CH}_3\text{OCH}_2\text{CH}_2\text{OCH}_3$

ANSUL ETHER — 141

DIETHYLENE GLYCOL DIMETHYL ETHER
 $\text{CH}_3(\text{OCH}_2\text{CH}_2)_2\text{OCH}_3$

ANSUL ETHER — 161

TRIETHYLENE GLYCOL DIMETHYL ETHER
 $\text{CH}_3(\text{OCH}_2\text{CH}_2)_3\text{OCH}_3$

ANSUL ETHER — 181

TETRAETHYLENE GLYCOL DIMETHYL ETHER
 $\text{CH}_3(\text{OCH}_2\text{CH}_2)_4\text{OCH}_3$

INTERMEDIATES

for
Organic
Syntheses

PHYSICAL PROPERTIES:

Molecular Weight _____ 124.13
Melting Point _____ 53°C.
Boiling Point _____ 243°C.
Solubility _____ readily soluble in alcohol, benzene, acetone, ethyl acetate, ethers. Soluble in water.
Color _____ white to colorless crystals or leaflets.
Odor _____ pleasant fragrance

PHYSICAL PROPERTIES:

Molecular Weight _____ 138.16
Melting Point _____ 56°C.
Boiling Point _____ 212.6°C.
Solubility _____ readily soluble in acetone, ethanol, ethyl acetate and benzene. Insoluble in water.
Color _____ white to colorless leaflets
Odor _____ pleasant fragrance (sweet clover)

For more information write for File No. 802. You will receive additional data regarding these versatile fine chemicals.



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When inquiring check CP 5203 on handy form, pgs. 2-3



Large refinery in the Midwest takes on a mystic air at midnight

REFINERY LENGTHENS EQUIPMENT LIFE

with Metal Grating-Refractory Concrete Linings

Corrosive and abrasive action of fluidized catalyst and petroleum gases at temperatures up to 1100°F in cat crackers and other refining units have been resisted for as long as five years, with practically no repairs required

Problem: A large refinery in the Midwest had excessive wear from corrosion, abrasion, and erosion on the inner surfaces of vessels and other equipment on cat crackers and other refining units. With the catalytic cracking towers, which operate with dry gas at 1050°F, the principal wear is from abrasion and erosion, rather than corrosion. Thermal fractionating columns, which operate at elevated temperatures at 400 psi pressure with liquid present, are more subject to direct losses from corrosion.

Fig 1 and 2 indicate the type of wear that has occurred in equipment in the past, necessitating expensive weld repairs or replacement. In order to solve these problems, company has tried a number of procedures, some of which follow:

(a) Steel shell only — This is generally not satisfactory. Effect of the fluidized catalyst on the bare steel of a slide valve that had been in

service 11,400 hours, or about one year and four months, is shown in Fig 1.

(b) Tile lining — Unsatisfactory performance obtained with tile lining in service for 12,133 hours, or about one year and five months, is illustrated in Fig 2, showing a typical condition found with such a liner. In this particular case, 32 sq ft of a regenerator was completely devoid of tile, permitting hot catalyst to circulate behind the tile and come in contact with the steel shell. Insulation was gone or badly rat-holed. In this case, the remainder of the lining, outside of this particular section, was in satisfactory condition and has continued to give good protection to the shell.

(c) Strip lining with alloy steel — This procedure prevents corrosion but requires expensive material and a great deal of welding.

(d) Wire mesh, 2 x 2" (12 x 12 gage) with



Fig 1—Typical erosion on an unlined wear plate of a lower slide valve after one year and four months service

refractory — Wire mesh had insufficient strength to remain in place and the concrete spalled.

(e) Expanded metal lathe or diamond mesh — This was hard to gun. In addition, a shearing action was created in the concrete. This type of lining didn't hold up.

corrosion control

(f) Hairpins — Pencil rods were used for reinforcement and then gunnited. This method created a strain that cracked the concrete.

(g) Sprayed aluminum liner — This type of treatment in a thickness of .0008 to .0012" is good for certain applications in stacks. It forms a firm mechanical bond. A disadvantage is that, although it provides corrosion protection under some conditions, it does not serve as insulation like a refractory lining.



Fig 2—Tile liner of this regenerator, in service about one and one-half years, broke loose in places, permitting hot catalyst to come in contact with the steel shell

In summary, an economical method of lining slide valves, regenerators, junction tees, cyclones, and other column sections was desired that would withstand the corrosive and erosive effects of the refinery gases.

Solution: Refinery started using liners on the larger diameter vessels consisting of a hexagonal steel grating, gunnited with refractory. Where temperature protection of the shell is required, insulating concrete is applied next to surface of shell, followed by 2" of refractory concrete with the 3/4" metal grating inbedded in it near the inside surface. The grating is rolled to form it

(Continued on next page)

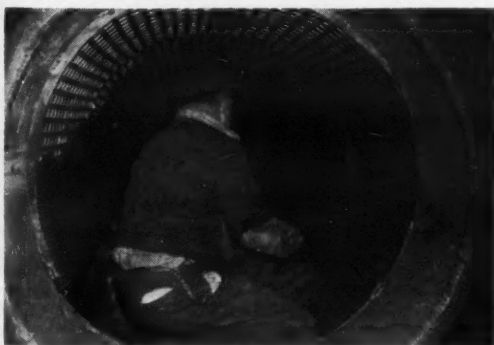


Fig 3—Lining of refractory concrete being applied over hexagonal steel mesh in a reactor cyclone



Basic design simplicity of the exclusive Milton Roy liquid end step-valve assures high and reproducible volumetric efficiency. The self-cleaning double ball-checks seat positively, dislodge any trapped particles by spinning action, are snap-acting.

Chemical Treatment Costs Drop with this Milton Roy Pump

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INSTRUMENTATION
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ON THE JOB in a well-known chemical processing plant, this Milton Roy Motor-Driven Controlled Volume Pump meters the flow of concentrated sulphuric acid to the deoiling step in an ore flotation process. The accurate control of acid addition results in minimum usage of concentrated sulphuric acid and subsequent caustic, thereby lowering treatment costs.

This is a typical example of how Milton Roy Pumps effect dollar savings in hundreds of applications throughout industry. As motor-driven or air-powered units, or as components of automatic systems, their accuracy and long service life bring measurable returns to users. In *boiler feed water treatment*, for example, they are used in all forms of handling internal or external treating chemicals; in *petroleum processing*, for crude desalting and gasoline treating; in *textile manufacturing*, for acid, alkali or bleach baths; in *instrumentation*, to satisfy control requirements.

These are rugged, dependable pumps. They meter practically any liquid—abrasive slurries, solids in suspension, solvents—in capacities from 3 milliliters per hour to 45 gallons per minute, against pressures up to 25,000 pounds per square inch with instrument accuracy. We invite your inquiries.



Bulletin No. 553 tells you how you can profitably use Milton Roy Motor-Driven Controlled Volume Pumps in your business. Write for your free copy.

Engineering Representatives in the United States, Canada, Mexico, Europe, Asia, South America and Africa.



Manufacturing Engineers • 300 E. MONTGOMERY LANE • PHILA. 18, PA.
CONTROLLED VOLUME PUMPS AND AUTOMATIC CHEMICAL FEED SYSTEMS

When inquiring check CP 5204 on handy form, pgs. 2-3

(Continued from preceding page)

into the shape of the vessel before it is inserted. An example of a liner being applied to a reactor cyclone is shown in accompanying Fig 3.

Loose clinch hexagonal metal grating with added flexibility is used to advantage in some applications. For the smaller diameter shells, such as cyclones,



Fig 4—View of expansion joints of a metal grating-refractory concrete lining which has withstood the action of refinery gases and fluidized catalyst for nearly two years

a still more flexible square mesh grating is used and gunnited with refractory in a similar manner. Where only a thin refractory lining is required, the grating has frequently been placed directly in contact with the shell. In some applications, such as catalyst carrier lines, where only abrasion resistance is required, the lining is placed on the outer radius of bends where abrasion is severe.

Of particular interest with respect to the more corrosive conditions in the thermal refining towers, is the increased use of stainless steel hexagonal



Fig 5—Metal grating and refractory lining still in excellent condition after nearly four years service

grating for this application. Type 410 (12-14% chrome) stainless steel has been used, but 410 modified, with .08% maximum carbon, is preferred because of its more desirable welding characteristics.

Results: Hexagonal metal grating-refractory concrete linings have been used in refinery vessels for as long as five years with practically no repairs required. An example, illustrating the expansion joints between panels of a regenerator lining, is shown in Fig 4. This lining has resisted the action of the refinery gases for 15,000 to 16,000 hours, or nearly two years. The slight repairs needed around the joints can be easily made with refractory concrete.

In Fig 5 is shown a metal grating and mastic lining

How a Georgia chemical company solves

For seven years the engineers at the Chemical Products Corporation plant in Cartersville, Ga., grappled with the difficult problem of handling a 32% hydrochloric acid solution containing traces of organics.

Three years ago, after successful tests, they installed PYREX brand "Double-Tough" glass pipe for this liquid-handling job—and solved the problem satisfactorily.

The hydrochloric acid (20° Bé.) is produced as a byproduct of a benzene chlorination operation, con-

densed from gas to liquid form. It is piped some 600 feet through the 2" PYREX pipeline, stored in outdoor tanks and used as required in other manufacturing processes.

Outdoor temperatures ranging from 0° to 100° F. are encountered in this service. The acid itself is not heated.

Cost of maintenance cut to bone

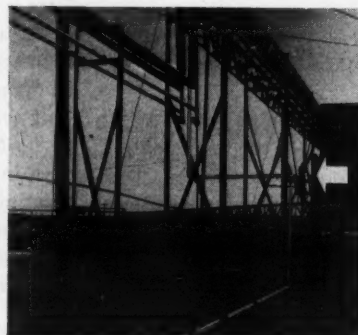
During its three years of service the PYREX pipe has required no maintenance traceable to its use. The

metal flanges and pipe joints are coated with Insulmastic paint for protection against atmospheric corrosion and possible gasket leaks.

Chemical Products Corporation is one of hundreds of chemical companies that have found the most satisfactory answer to such severe pipeline corrosion problems by installing PYREX brand glass pipe. If you have stubborn problems of this nature, the information on the next page may interest you. Mail the coupon today for more detailed information.



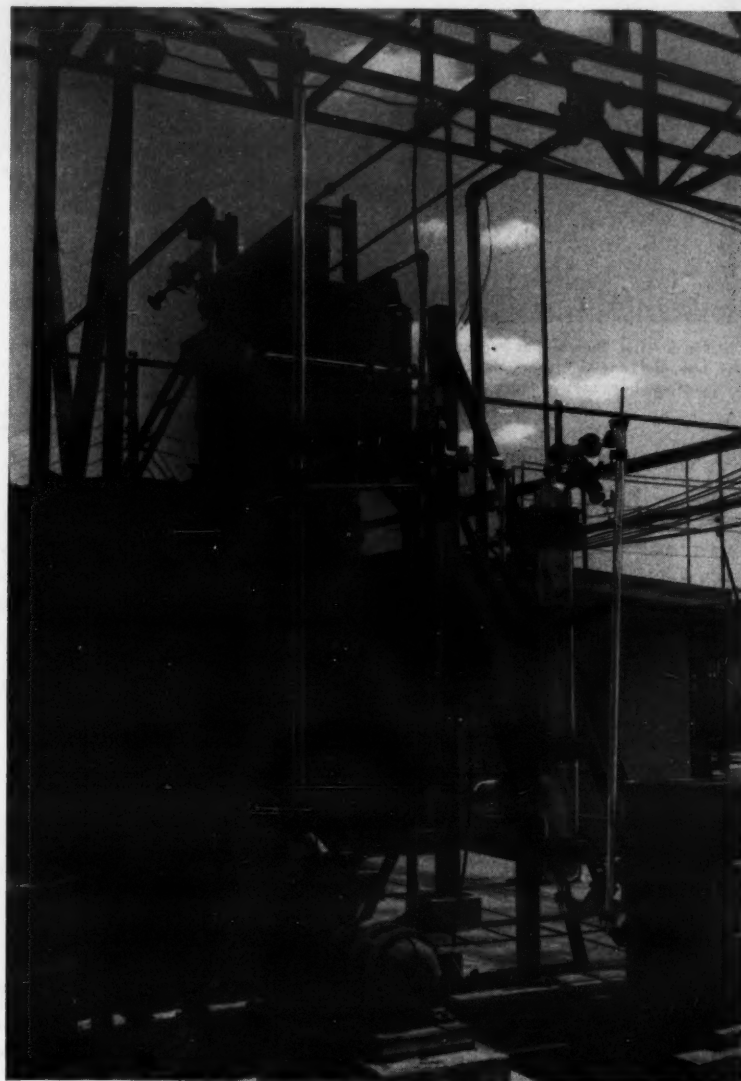
A portion of the 450-foot bridge which carries the PYREX pipeline from condenser storage to processing storage 600 feet away. (The last 150 feet of the line is on ground-level supports.) The severity of the corrosion problem involved in this liquid handling is due to traces of organics remaining in the HCl.



Midway in its descent from the bridge to the ground level supports, the PYREX line carries a valve and hose for unloading tank cars and tank trucks when necessary.



The final turn of the long PYREX pipeline discharges the HCl solution into three 1,000-gallon tanks. (The picture shows a corner of one of them.) Much of the credit for Chemical Products Corporation's trouble-free experience with this PYREX pipe installation is due to a well designed system of supports for the line.



System of PYREX pipe which serves the plant-assembled PYREX gravity separator (visible at right of above picture) where hydrochloric acid is separated from organ-

ic liquids carried over from a benzene-chlorine reaction. The pump in the foreground pumps the acid through the long pipeline shown in the other pictures.

olve severe acid handling problem

This pipe ends corrosion problems

Recent years have seen a remarkable increase in appreciation of the fact that the characteristics which dictate the choice of glass in laboratory applications, apply equally well to the handling of corrosive or sensitive fluids in industrial processes.

PYREX brand "Double-Tough" glass pipe, designed for fullscale production operations and doubled in strength by end-tempering, has repaid its cost many fold in a great variety of chemical handling operations.

Remarkable corrosion resistance reduces pipeline replacements

The story of the Chemical Products Corporation's PYREX pipe experience, on the opposite page, demonstrates one of the common advantages:—elimination of periodic replacements of pipeline because of acid corrosion.

Other advantages

Non-Contamination—Most materials will not stick to the smooth, hard surface of PYREX pipe. Surface deposits either do not build up or are easily removed. It is simple to clean and sterilize. It neither gives nor picks up any measurable taint of color, taste or odor.

Transparency—Where it is important to see the flow of material in a pipeline, the clear transparency of PYREX pipe is essential. Visual demonstration of internal cleanliness is often desirable.

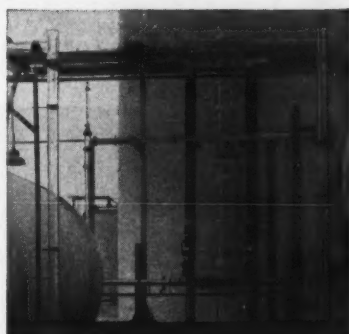
Operating temperatures—PYREX brand piping is operating satisfactorily in outdoor installations with temperatures of less than 0° F., and in indoor installations with liquids at temperatures as high as 250° F., and higher in special cases.

Installation—PYREX pipe is easy to install and low in installed cost compared with other corrosion-resistant materials. It is available in six standard sizes from 1- to 6-inch I. D., inclusive.

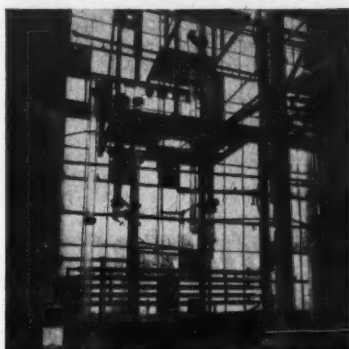
Detailed information yours for the asking

Since it is to your advantage to weigh the inherent and relative advantages against the disadvantages of any pipeline material before making an installation, we invite you to discuss your particular problem with a PYREX pipe representative at your convenience.

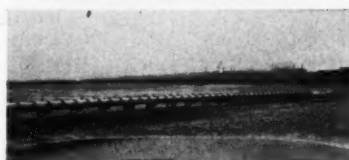
Meanwhile, the literature listed on the return coupon at right will give you many more facts than there is room for here. Just check the items you would like to receive, fill out the coupon and we will act promptly upon its receipt.



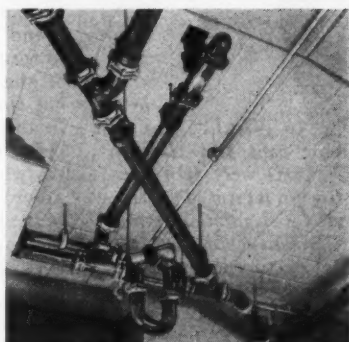
Monochloro benzene — operating conditions 230° F. at 30 p.s.i.



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in a reactor cyclone which is still in excellent condition after 31,633 hours, or nearly four years of service. Area in left portion of photograph was not gunnited with refractory when lining was originally installed. In fact, it has never been necessary to replace a cyclone that was completely lined. Although the stainless steel grating has a higher initial cost, its use in bubble tower pipe stills, evaporators, and other places has been found to be justified by its additional resistance to corrosion. Engineers at the refinery believe that these types of linings are doing a good job.

(Refractories from a number of different companies, as well as their own mix, have been used in linings at the refinery. The hexagonal grating, known as Hexteel, and the square mesh grating, known as Floorsteel, are products of the Klemp Metal Grating Corp., Dept. CP, 1371 N. Branch St., Chicago 22, Ill. . . . or for more information check CP 5206 on handy form, pages 2 and 3.)

Corrosion controlled in joints by washer made from plastic and glass fiber . . .

may eliminate steel washer when used with sleeve and washer insulation set

Uses: On oil and gas company insulated flanges.

Features: Washers placed around bolts and sleeves electrically insulate joints and eliminate corrosion caused by galvanic, stray, or long line currents. High dielectric strength helps in this respect. Another advantage is the high compressive strength. Tests have indicated that with the insulating washer, the steel washer used in conjunction with sleeve and washer insulation set may no longer be necessary. Low water absorption of washer is also of value.

Description: Insulating washers are fabricated from plastic and fiber glass matt. Properties as compared with canvas phenolic washers are as follows:

Property	Glass-plastic	Canvas phenolic
Flexural strength, psi	34,000	20,000
Impact strength, izod	19.2	3.2
Tensile strength, psi	17,300	9500
Compressive strength, psi	53,100	38,000
Water absorption, %, ASTM	0.36	3.0
Dielectric strength, V/M	280	200
Dielectric constant, % at 60 cy	4.1	7.0
Power factor, % at 60 cy	2.4	0.10

(Product of Plastic Engineering & Sales Corp., Dept. CP, P.O. Box 1037, Fort Worth, Tex. . . . or check CP 5207, pages 2 and 3.)

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it's **CORROSION-RESISTANT**

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TUBING**

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Weldco is available in Monel, Stainless, Inconel, Nickel and other alloys, in sizes from 3" to 30" O. D. Other sizes for special applications. Whenever you need light-weight, high-strength tubing, specify Weldco and be sure of getting the best.

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When inquiring check CP 5208 on handy form, pgs. 2-3

*corrosion
control*



Fig 1—Bubble caps and trays for a large South American refinery fabricated from Monel to guard against corrosion from hydrochloric acid in the upper tower sections

MONEL CONTROLS CORROSION

in Upper Tower Sections

Withstands attack of hydrochloric acid, is ductile enough to resist breakage, and is not subject to stress corrosion

Problem: Prior to World War II practically all bubble caps and trays in refinery "topping" plants were fabricated of cast iron. As towers increased in size, however, the need for lighter internals became apparent. Breakage of cast iron caps made a more ductile material desirable. Also, in many cases more corrosion-resistant materials were needed.

Accordingly, trays and caps were fabricated of lightweight stainless steel. To combat corrosion of the tower shell, linings were also made of the same material. This method proved successful in providing protection against sulfur attack at high temperatures, the condition present in approximately two-thirds of the tower. However, it was noticed that in some cases, the top four trays of the towers, as well as the linings, would disintegrate as

a result of corrosion while lower trays remained virtually intact.

The trouble lay in the salts, such as magnesium and calcium chloride, ordinarily found in crude oil. These salts hydrolyze to form hydrochloric acid. Lower sections of the crude-fractionating tower are too hot for the acid to exist in liquid form. In the upper portions, which are cooled by returning reflux, aqueous hydrochloric acid can and does exist. It not only destroyed bubble caps and trays, but could also cause serious damage to the unprotected shell as well.

Solution: The most economical solution to dual corrosion was found to lie in using two different metals for tower internals. Topmost section, where corrosion was due to hydrochloric acid, is protected by use of Monel bubble caps and trays. Remainder of tower is protected by stainless steel. Following tabulation of a corrosion test represents some of the worst conditions involving the processing of West Texas crude. Specimens were exposed for 60 days in straight run gasoline vapor at the top of the tower maintained at an average temperature of 250°F.



Fig 2—Typical of towers in this country and abroad, in which the top sections are Monel-lined and utilize Monel bubble caps and trays, is this pipe still tower in a refinery in Fawley, England

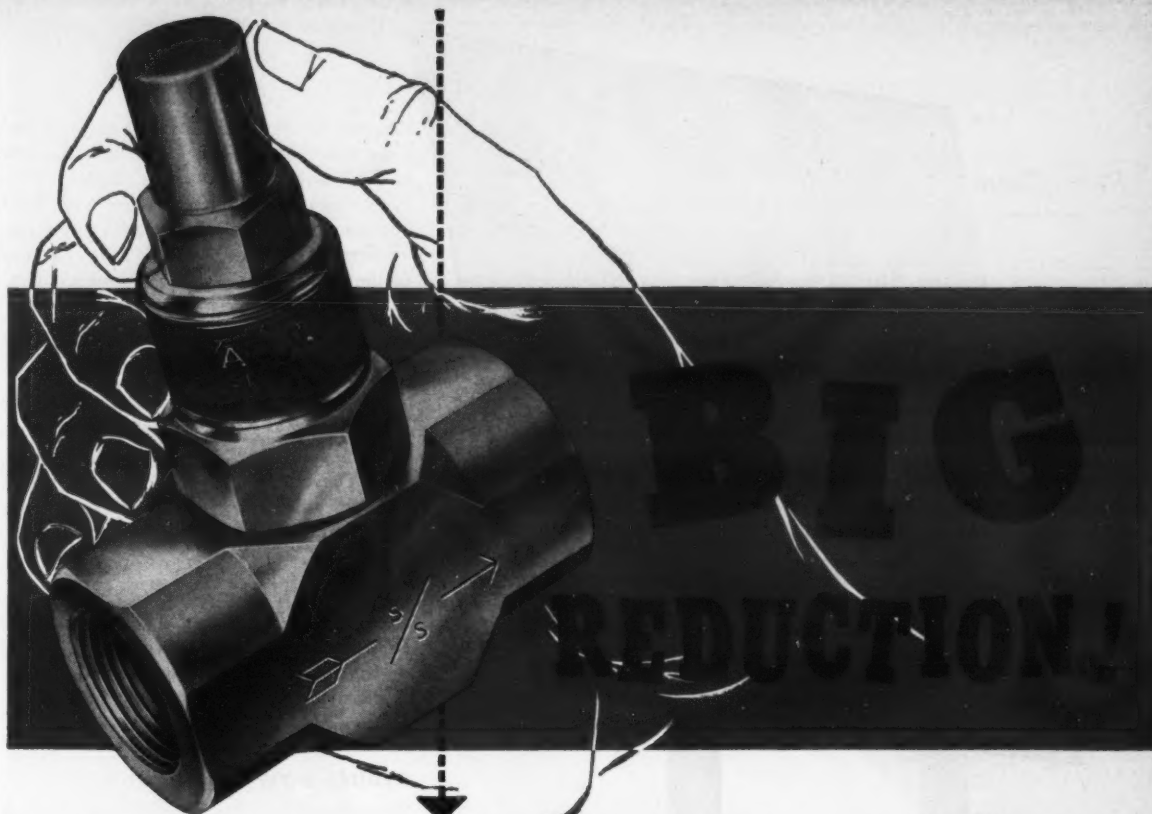
Material	Indicated corrosion rate in inches penetration per year	Maximum pitting during test in inches
Monel	0.0031	None
Nickel	0.0057	0.013
Inconel	0.017	0.016
Type 302 SS	*	—
Type 304 SS	*	—
Type 316 SS	0.053	0.001
Nickel steel, 5%, SAE 2512	*	—
Mild steel	*	—
Ni-Resist	0.051	None
Cast iron	0.181	Graphitized

*Specimens of Types 302 and 304 stainless steel and 5% nickel steel, originally 0.031" in thickness, and mild steel, 0.062" thick, were completely destroyed during test period.

Test data indicate that mild steel as well as the 18-8 types of stainless steel, 5% nickel steel, and cast iron are definitely unsuitable under these conditions. It is apparent also that nickel and Inconel are not adequate because of their susceptibility to severe pitting attack. Type 316 stainless steel shows a reasonable corrosion rate. While depth of local attack of 316 was rather insignificant, this tendency nevertheless exists and it has been noted to be much more serious under similar circumstances.

Of the remaining materials, Monel proved to be outstanding from the standpoint of resistance to both general corrosion and pitting. Because of this fact,

(Continued on next page)



8-hour job now takes 4 hours

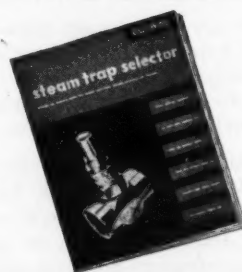
At a western magnesium reduction plant something besides magnesium has just been reduced. The steam at the end of the 1 1/2 mile long steam line wasn't so hot—and neither was the production record of the plant at that location.

Then 26 old-type steam traps were replaced with Yarway Impulse Traps. Now there is only a 15° temperature drop from the boilers to the end of the line. Most important, the plant 1 1/2 miles from the boilers is now able to do work in 4 hours that previously took 8 hours.

That's trap efficiency! It's evidence of the fact that Yarways are designed to send the most premium B.T.U.'s at top temperatures into your process or product. They get equipment hotter, sooner . . . and keep it hot.

Other Yarway features—small size, one moving part, easy installation, low maintenance, low cost, stainless steel construction. Over 800,000 Yarways have already been installed. For your Yarways, see local distributor named below.

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the steam trap

designed with more production in mind

NEW STEAM TRAP MOVIE

"Please Pass The Condensate" is a new 20-minute, color film on steam trapping for more production. Write now to arrange a plant or group showing.

When inquiring check CP 5209 on handy form, pgs. 2-3

Petro-Chem Development Company Reports:

No Shutdowns for Refractories Maintenance

IN OVER
1200 FURNACES

In 1940, the Petro-Chem Development Company lined their first Iso-Flow furnace with B&W Insulating Firebrick. Today, over 1200 installations later, (some with fluid outlet temperatures over 1600F) not a single furnace has ever been shut down because of the need for refractory maintenance.

Long life is just one reason furnace builders, as well as furnace operators, insist on B&W IFB. Here are four more:

CUT INSTALLATION COSTS

B&W Insulating Firebrick are easy to install. They can be cut, drilled or shaped on the job with ordinary woodworking tools. Their lightness makes them easy to handle.

ELIMINATE EXPENSIVE ALLOYS

Because of their high insulating values, B&W Insulating Firebrick can be supported or anchored with ordinary carbon steel. Expensive, heat-resisting alloys are not necessary.

REDUCE DOWN-TIME

These brick have low heat storage, cool off quickly. This makes possible quick access to the furnace for inspection. They heat up quickly to get back on the line, too.

CLOSE TEMPERATURE CONTROL

Due to the low heat-storage capacity of B&W IFB, their hot-face temperature responds quickly to changes in the rate of heat input to the furnace—insuring the closest possible temperature control.

You, too, can profit by this four-way economy of B&W Insulating Firebrick. Ask your B&W representative for all the facts on these cost-cutting refractories. He'll be glad to discuss your refractory problems with you.

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Chemical Recovery Units... Seamless & Welded Tubes... Pulverizers... Fuel Burning Equipment... Pressure Vessels... Alloy Castings

When inquiring check CP 5210 on handy form, pgs. 2-3

CORROSION CONTROL

(Continued from preceding page)

it has been adopted to a considerable extent as a lining or as a Monel-clad steel shell for upper tower sections, reflux and distillate accumulators and condenser shells, and in some cases for reflux and run-down lines. It is also used for fabricating bubble caps, plates, and fittings in upper tower sections.

Whereas Monel is usually preferable for the upper tower sections, stainless steel is the accepted material for bubble caps and linings in the lower 2/3 of the tower, due to its ability to resist high-temperature sulfur corrosion. Type 316 stainless steel has been found to be satisfactory for use in the upper tower sections by some operators. However, it is likely in these cases the corroding agents were organic acids such as acetic, propionic, possibly naphthenic, H_2S , SO_2 , or SO_3 , rather than hydrochloric acid. For naphthenic acid corrosion, a West Coast refiner has found that aluminum has given acceptable results at temperatures below 300°F.

Initial cost for Monel trays, as compared with 12% chrome, Type 410, is about 75% higher. However, refineries are most interested in minimum downtime and are willing to consider the more expensive material to achieve satisfactory results. Monel bubble trays have been manufactured for most major oil companies, both in this country and abroad, by fabricator cooperating in the preparation of this article. Monel bubble caps and trays manufactured for a large South American refinery by this fabricator are shown in accompanying Fig 1.

Another example of the use of Monel in columns appears in Fig 2, a pipe still tower in a refinery in Fawley, England. The Monel section is at the top, where the internal diameter of the tower is 15'. Here the walls, for a height of 9' 4½", are lined with Monel-clad sheet 9/16" thick, including 20% Monel cladding. Monel bubble caps are also used in this section.

A third example of using Monel to control corrosion concerns its use in a topping unit in a large refinery in Southwestern Illinois. Monel is used as a lining for the upper sections of the fractionating columns as well as for the bubble caps in this section, where the temperature may rise to 330°F. Overhead condenser shells are also lined with Monel and equipped with tubes and tube sheets made of this alloy.

This use of Monel in towers may be found also in one of the largest refineries in the world located in the Philadelphia area. One typical tower has upper portion lined with Monel, while top nine bubble tray assemblies, shower decks, and overhead vapor lines are Monel.

Results: In refinery applications such as the foregoing, where Type 410 has been known to corrode out within six months, Monel appears to have indefinite life. As far as is known, the Monel bubble trays manufactured by fabricator for refineries here and in foreign countries the past several years are still giving very satisfactory service.

Another reason why Monel is preferred over cast iron is its ductility. Cast iron bubble caps are

subject to breakage in installation and during the process of removing the coke that builds up on them. Another advantage of Monel is that it is not subject to stress corrosion in this application, whereas certain grades of stainless steel may fail in the presence of chlorides in this manner, if stresses are present anywhere.

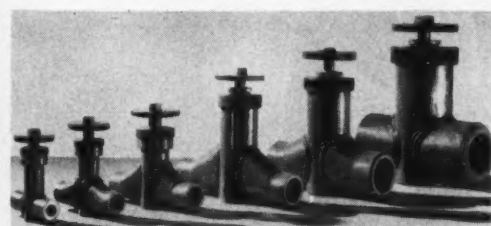
In comparing Monel and stainless steel, however, it should be kept in mind that the latter is the accepted material for bubble caps and linings in the lower 2/3 of the tower. It is not a question of the two alloys being competitive, but of selecting the right one to do the right job in the right place.

(Information on the application of Monel within the oil refining and chemical processing industries may be obtained from International Nickel Co., Dept. CP, 67 Wall St., New York 5, N. Y. . . . or for more information check CP 5211a on handy form, pages 2 and 3.)

(Lightweight bubble caps and trays, such as those appearing in Fig 1, and numerous other types and shapes, are fabricated by Fritz W. Glitsch & Sons, Inc., Dept. CP, P.O. Box 6227, Dallas 2, Tex. . . . or for more information check CP 5211b on handy form, pages 2 and 3.)

Unplasticized polyvinyl chloride needle and globe valves cut corrosion in pipe lines

Use of needle and globe valves made of Boltaron 6200 unplasticized polyvinyl chloride will lessen corrosion in pipe lines by permitting installation of 100% corrosion-resistant systems. Material has excellent chemical resistance to organic and inorganic acids, alkalis, alcohol, and foodstuffs. Material is non-toxic. It may be drawn, formed, molded, ma-



Polyvinyl chloride valves are available in sizes from 1/8 up to 2"

chined and welded by hot air method — thus being specifically adaptable to specific industry needs. Valves can be furnished in standard IPS sizes from 1/8 up to 2". In addition to pipe, fittings, and valves, material is also available in 30 x 60" sheets in 1/32 to 1" thicknesses and in 10" rods in 1/4 to 2" thicknesses.

(Boltaron 6200 valves are product of H. N. Hartwell and Son, Inc., Dept. CP, Park Sq. Bldg., Boston, Mass. . . . or for more information check CP 5212 on handy form, pages 2 and 3.)

NT OF



SERIES LB CONOMOTOR CONTROL VALVES

Great strides have been made in recent years in the fields of instrumentation and automatic control. Most consideration has been given to primary elements, signal transmission and control instruments. But, not much has been done to radically change the *final control element*.

In the past decade Conoflow has made many contributions to the field of Final Control Elements by the development of pneumatic operators for throttling control service. Today, the Conoflow LB Control Valve represents one of the greatest forward steps in control valve design. We believe it heralds a new era of original thinking in keeping with the modern standards of the completely automatic plant.

The LB Conomotor Control Valve features a new type of pneumatic operator with ability to *sense* and *position*, and

with *power* to operate under sudden load changes. It is mechanically sound with reliable *accuracy* and *stability*. It combines a new design of the already approved Conomotor Cylinder operator with a single seated, split body, integral bonnet valve, with an honest-to-goodness renewable seat ring and a fully guided plug and stem assembly. Result . . . the optimum in control and dependability.

Tho designed for the processing and power industries, Cylinder Conomotor Valves are finding application in hundreds of services that demand accurate and trouble-free control of a wide variety of fluid flows. Chances are, this is the all-important final link you have long sought for your control loop. It's worth talking over . . . Just write or phone today.

Write for Catalog LB-1, heralding this new "Step Ahead in Cybernetics."

CONOFLOW CORPORATION

Foremost Manufacturers of Final Control Elements

2100 ARCH STREET, PHILADELPHIA 3, PENNSYLVANIA

When inquiring check CP 5213 on handy form, pgs. 2-3

CORROSION CONTROL

Oil additive inhibits rust

Uses: Immediate indicated uses include the protection of diesel and gasoline engines, turbines, pipe lines, and ferrous tools or components in production stages.

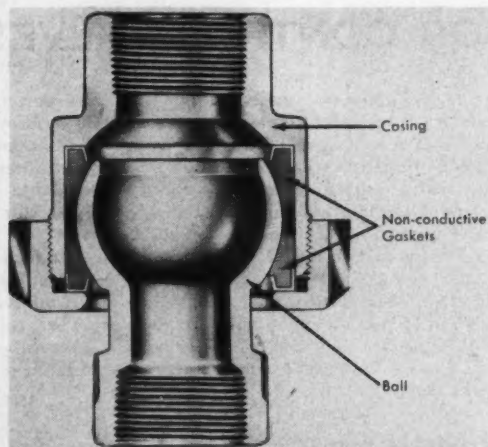
Features: Product is believed to offer more complete protection of ferrous surfaces than has been possible heretofore with other non-metallic inhibitors. In internal combustion engines, material provides freedom from pre-ignition and other undesirable effects of ashy residue encountered with sulfonic inhibitors containing the salts of such metals as sodium, barium, or calcium.

Description: Identified as Atpet 100, inhibitor is a sorbitan mono fatty acid ester akin to manufacturer's Span 80. Extensive testing shows material furnishes considerably better corrosion resistance than earlier kindred products. This is emphasized by behavior of product in highly refined and treated oils which tend to resist the action of inhibitors. It is shipped as a concentrate for addition by the refiner or compounder to his oil.

(Atpet 100 is product of Atlas Powder Co., Dept. CP, 904 Market St., Wilmington 99, Del. . . or for more information check CP 5214 on handy form, pages 2 and 3.)

Pitting or corrosion in pipe lines prevented by insulating joints

Uses: Insulating joints are widely used in pipe lines connected to cleaning and plating tanks. They may also be used for preventing corrosion



Cross-sectional view of insulating joint

due to electrolysis in other applications where lines are conveying steam, water, or other liquids or gases.

Features: Joints prevent pitting or corrosion due to electrolysis, besides eliminating wasteful leakage of current and promoting safety. An

THESE TEN-YEAR-OLD PUMPS for circulating organic acids are built entirely of Stainless Steel. In spite of their long service, they are still in very good condition.



STAINLESS STEEL STRIPPING MILL is used for removing water from organic liquids. It is four years old and still ready for more service.

STAINLESS STEEL also resists corrosion in the column and kettle of this batch still kettle for distillation of esters. The equipment, still in good condition, has been in use three years.



For corrosion resistance in p



ALL PARTS of this automatic bagging machine in contact with hot resin are Stainless Steel. Stainless is used to prevent contamination of vinyl resin.

and kettle
equipment, still

WHEEL AND ALL INTERNALS of this still for distillation of acetic acid are Stainless Steel for resistance to corrosion. The Stainless is in good condition after three to four years' service.

OLIVER LEAF FILTER, used to remove salt from an organic base, has shell, leaves and valves of Stainless Steel. In service between four and five years, it is in excellent condition.



stance in petro-chemical operations

THIS MAJOR TEXAS PRODUCER SELECTS STAINLESS STEEL

● At its big Gulf Coast operation, this producer of petro-chemicals makes extensive use of Stainless Steel in many types of processing equipment.

In some of these applications, Stainless Steel's resistance to corrosion led to its selection. In others, the absence of product contamination that Stainless assures was the determining factor.

These are only two of the important benefits of Stainless Steel in chemical processing equipment.

Others include ease of cleaning, elimination of downtime for replacement, excellent performance in certain high temperature operations or when high pressures are involved.

It will pay you to investigate the use of Stainless Steel in your plant wherever you need these benefits. And if you want the finest performance, be sure you use perfected, service-tested U·S·S Stainless Steel.

UNITED STATES STEEL CORPORATION, PITTSBURGH • AMERICAN STEEL & WIRE DIVISION, CLEVELAND • COLUMBIA-GENEVA STEEL DIVISION, SAN FRANCISCO
NATIONAL TUBE DIVISION, PITTSBURGH • TENNESSEE COAL & IRON DIVISION, FAIRFIELD, ALA. • UNITED STATES STEEL SUPPLY DIVISION, WAREHOUSE DISTRIBUTORS
UNITED STATES STEEL EXPORT COMPANY, NEW YORK

U·S·S STAINLESS STEEL

SHEETS • STRIP • PLATES • BARS • BILLETS • PIPE • TUBES • WIRE • SPECIAL SECTIONS

UNITED STATES STEEL



2-1087

When inquiring check CP 5215 on handy form, pgs. 2-3

CORROSION CONTROL

insulating barrier is said to be formed in the pipe without interfering with its capacity or efficiency.

Description: As shown in accompanying illustration, insulating joint consists of a simple threaded malleable iron ball end supported between two non-conductive, O-type molded gaskets housed in a threaded malleable iron casing. In a dry condition, joint has a resistance of approximately 100,000,000 ohms. When used with water, resistance through the connection depends on the pH of the water. For a single joint, used with steam, 50-60 volts is a safe maximum. For higher voltages, two or more joints can be connected in series.

Joints are available for pipe sizes ranging from 1/4 to 6" in malleable iron, with threaded ends as standard. They are suitable for temperatures up to 425°F and pressures to 300 psi (steam), or as high as 2000 psi (hydraulic) in the smaller sizes. Joints can also be furnished in steel and alloys, and in 4 and 6" sizes, flanged.

(Insulating joints are product of Dept. J-38, Barco Mfg. Co., Dept. CP, 500 Hough St., Barrington, Ill. . . . or for more information check CP 5216 on handy form, pages 2 and 3.)

Titanium base alloy not affected in sea water corrosion test

In a recent sea water corrosion test, titanium base alloy RC-130-A suffered no visible corrosion or erosion damage, nor did pitting occur beneath the specimen supports. Study was conducted under the auspices of the US Naval Engineering Experiment Station, Annapolis, Md. Two titanium alloy specimens approximately 4 x 3/4 x 1/8" were mounted with insulated fasteners on the periphery of a micarta disk. Assembly was rotated for 60 days in natural sea water at a specimen velocity of 27 ft/sec.

(Courtesy of Rem-Cru Titanium, Inc., Dept. CP, Midland, Pa.)

Ammonia and hydrogen sulfide resisted by aluminum heat exchangers . . .

costs cut in refineries since units do not cause sludging of oils or furfurals

Aluminum's high resistance to attack by ammonia, carbon dioxide, hydrocarbons and hydrogen sulfide is causing it to be used in increasing amounts in refineries for such applications as heat exchangers. Petroleum processing plants are reported to be saving up to \$1000 per year per heat exchanger by changing to aluminum, which does not cause sludging of oils or furfural. Use of aluminum tubes for lube oil and furfural coolers is already widely accepted practice because of this anti-sludging action.

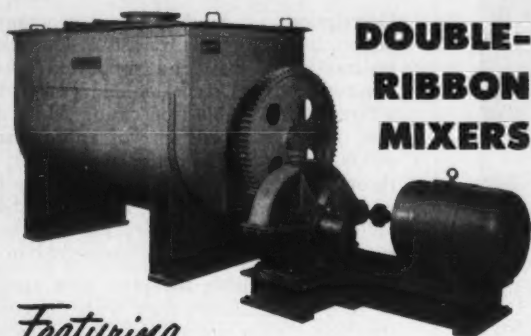
(Courtesy of Reynolds Metals Co., Dept. CP, 2500 S. Third St., Louisville, Ky. . . . or for more information check CP 5217, pages 2 and 3.)

with hot
amination

SSING

DECEMBER, 1953

Devine

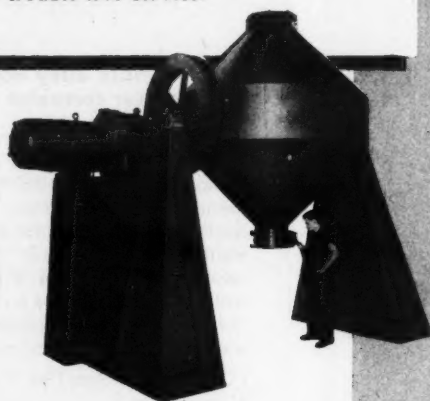


DOUBLE- RIBBON MIXERS

Featuring

"Mix-and-Countertermix" action

Devine Double-Ribbon Mixers provide increased production along with reduced processing costs. Here's why: "mix-and-countertermix" action for more efficient mixing; removable ribbon assembly for fast cleaning; functional design for wide range of heavy duty mixing operations; all-welded construction for long, trouble-free service.



DOUBLE- CONE BLENDERS

Featuring

"Roll-and-Fold" action

Proven on the job to be dependable and efficient—today thousands of Devine Double-Cone Blenders are used throughout the food and chemical processing industries for blending powders, crystals, etc. They provide positive control of charging and discharging, rapid cleaning and minimum contamination.

Write for complete catalog information . . .

J. P. DEVINE MFG. CO., Inc.

49th Street and AVRR Pittsburgh 1, Pennsylvania

Devine
PROCESSING EQUIPMENT

When inquiring check CP 5218 on handy form, pgs. 2-3

CORROSION

Oxidizing chemicals resisted by cement at 1 to 11 pH

Vinyl base chemical resistant cement, known as Vitroplast, has found considerable use in chlorine dioxide and other bleaching units operating at pH ranging from 1 to 11. It is said to be one of the few known materials of construction that will resist oxidizing conditions throughout this wide pH range.

Product is reported to be completely resistant to hydrochloric acid, phosphoric acid, 60% sulfuric acid, 5% nitric acid, 5% chromic acid, sodium hypochlorite, benzene, gasoline, and chlorine dioxide at temperatures up to 150°F.

Unlike standard chemical resistant cements, material does not require acid or alkaline setting agents and will set in contact with concrete or steel under adverse conditions. It has a working time of approximately 40 minutes and a setting time of less than two hours at ordinary temperatures.

In addition to being used for joining brick in chemical process industries, product has been used as a patching cement and for repair of ceramic units. It is available as a white bleach resistant cement or can be supplied in specific colors. It is furnished in either powder or liquid form.

(Nitroplast cement is development of the Atlas Mineral Products Co., Dept. CP, 26 Walnut St., Mertztown, Pa. . . or for more information check CP 5219 on handy form, pages 2 and 3.)

Filter pumps for corrosives

Function, design, and application of corrosion-resistant filter pumps are described in eight-page leaflet. Equipment described is in the 50 to 100 gph range.

Booklet, "Sethco Filter Pump Units" is issued by Sethco Mfg. Co., Dept. CP, 70-78 Willoughby St., Brooklyn 1, N. Y. When inquiring specify CP 5220 on handy form, pages 2 and 3.

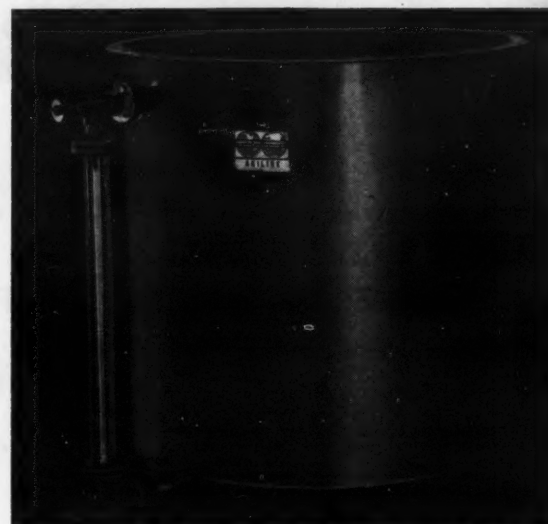
AGILENE

AGILIDE

We have
Economical Answer
**TO YOUR
CORROSION PROBLEMS**

IN CHEMICAL PROCESS EQUIPMENT

Agile's high-grade thermoplastic construction materials—AGILENE and AGILIDE—fabricated by a combination of forming and welding processes in which we specialize, are your safeguard for an economical and properly engineered fabrication or installation.



Self-supporting acid make-up tank fabricated entirely from AGILIDE (non-plasticized polyvinyl chloride) complete with sightglass, valves and shut-off spigot. It measures 24" diameter by 30" high with 1/4" wall thickness. It was fabricated for American Cyanamid, Stamford, Conn., by the hot gas welding process. These tanks can be furnished in any size to your specifications.

SEND YOUR INQUIRIES TO



American Agile Corporation

Plant and General Offices • 3461 Dunham Rd., Maple Heights, Ohio
Mailing Address, P. O. Box 168 • Bedford, Ohio

DEPT. C-1

When inquiring check CP 5221 on handy form, pgs. 2-3

CHEMICAL PROCESSING

CN-7MCu alloy resists caustic of 20 & 40% concentration up to 350°F

In a recent study conducted at Ohio State University, preliminary tests on CN-7MCu alloy showed that it is very resistant to 20 and 40% caustic at temperatures up to 350°F. These were the most severe tests made. The CF-8 stainless steels withstand sodium hydroxide of all concentrations below 50% by weight at all temperatures up to the boiling point. As the caustic concentration is increased over 50%, the CF-8 alloy shows a decrease in corrosion resistance.

Alloys CF-8 and CF-8M both exhibit increasing corrosion rates with increasing temperatures. The CN-7MCu alloy is much superior to the CF-8 type alloys in all concentrations of caustic, particularly in the concentrated solutions at temperatures of 200 to 300°F and higher.

Tests at temperatures slightly above the normal boiling points of aqueous sodium hydroxide solutions show substantial increases in corrosion rates for the CF-8, CF-8M, and CN-7MCu alloys. Intermediate concentrations of caustic, 40 and 60%, are more corrosive than the 20 and 80% concentrations at similar temperatures.

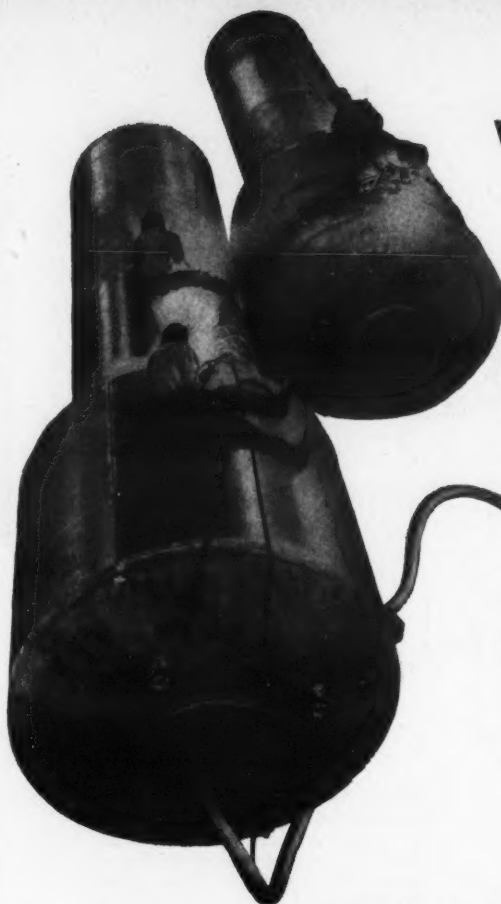
Both the CF-8 and CF-8M alloys showed severe undercutting or sub-surface corrosion in 40 and 60% caustic at 425°F. This effect was noted to a lesser extent at 360°F in the same concentration of caustic. Specimens displaying this "sub-surface" corrosion maintained bright surface films of metal which could be peeled off to reveal a layer of corrosion product. Longer exposure times, in excess of the 20 hr test periods used in these studies, would probably destroy the surface film.

(Information obtained from technical paper, "Corrosion by Aqueous Solutions at Elevated Temperatures and Pressures," by F. N. Beck and M. G. Fontana of Ohio State University, Dept. CP, Columbus 10, Ohio. The paper was presented at the 1953 National Association of Corrosion Engineers Conference in Chicago.)

Prevention of corrosion facilitated by easily removable flux for inert gas welding

Easily removable flux is said to make it much easier to control corrosion after welding stainless steels. Normally, the root (backside) of an inert gas joint remains unprotected. Previously, considerable oxidation occurred, requiring painstaking grinding to prevent corrosion. Product is thus a back-up flux for stainless steels, and also nickel, Monel, Inconel, and other alloys. When applied to the underside of butt and corner joints, penetration is simplified by flux action in controlling the molten weld metal.

(Eutector Flux 569-I is product of Dept. P, Eutectic Welding Alloys Corp., Dept. CP, Northern Blvd. and 172nd St., Flushing, N. Y. . . . or for more information check CP 5222 on handy form, pages 2 and 3.)



In Ammonium Sulfate Manufacture Monel is used for mother liquor tanks, scrubbers and in saturators like these being made at the Colonial Iron Works, Cleveland, Ohio. Each of these units is 30 feet high, with a 6 ft. diameter at the bottom, 9 ft. diameter at the top. $\frac{3}{4}$ " Monel plate is used for the shells.

Where to post Monel to guard against Sulfuric Acid Attack!

It takes a "command decision" to safeguard equipment against sulfuric acid corrosion.

You need to know under what conditions the attack will be made . . . and which of the materials at your command will put up the strongest defense.

If conditions are essentially reducing — if the concentration of the acid is below 80-85% at room temperature (or 12 to 15% at boiling temperature), and oxidizing compounds are absent — the chances are that Monel is the most economical alloy you can use.

Specific Examples

Organic Sulfations and Sulfonations: Monel is used in complete reactors, in linings, heating coils, agitators, pipe, fittings, and pumps. In making alkyl aryl sulfonates, Monel is widely used in neutralization, settling and evaporating equipment, to prevent corrosion and protect product purity. Sulfated oils processed in Monel equipment are normally equivalent in color to those processed in glass.

Fat Splitting and Organic Esterifications and Condensations: Monel is a standard material here to resist corrosion by the sulfuric acid commonly employed as catalyst. Solid or lined splitting tanks, for example, have shown less than .01 inches loss of metal in a year of continuous operation. Even where liquid temperatures go as high as 300° F., Monel heating coils are being used successfully. In condensing phenol-formaldehyde resins, reaction kettles, agitators, vapor lines and the condensers are all made of Monel.

Petroleum Refining: Monel tanks are used for sulfuric acid treatment and subsequent washing of lubes and light industrial oils; Monel cloth to filter clay-treated acid stocks, Monel bowls for sludge separation centrifuges and Monel rods for sludge handling pumps.

Treating Coal Distillates: Monel tanks and agitators are used in treating crude benzol, light oils, naphthalene and similar products with sulfuric acid.

Whenever you deal with dilute sulfuric acid there is an excellent chance that Monel is the best and most economical metal to use to safeguard your equipment.

If Monel won't do . . . one of the other Inco Nickel Alloys may prove to be just what you need. For further guidance contact Inco's Development and Research Division . . . and write for our 44-page Technical Bulletin T-3, "Resistance of Monel, Nickel and High Nickel Alloys to Corrosion by Sulfuric Acid."

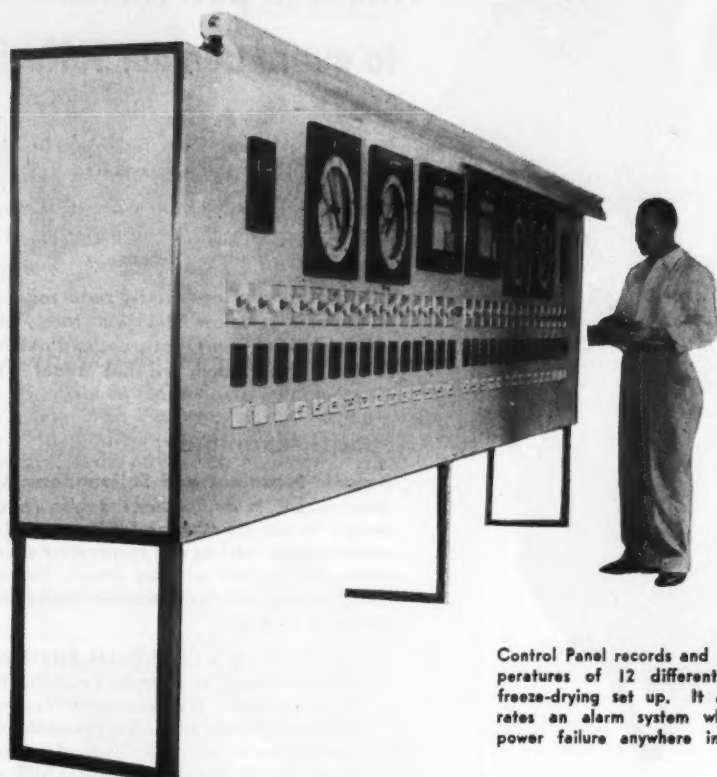
THE INTERNATIONAL NICKEL COMPANY, INC.
67 Wall Street New York 5, N. Y.

Inco Nickel Alloys

Monel . . . for minimum maintenance



When inquiring check CP 5223 on handy form, pgs. 2-3



Control Panel records and controls temperatures of 12 different stations in freeze-drying set up. It also incorporates an alarm system which tells of power failure anywhere in the system

FREEZE DRYING

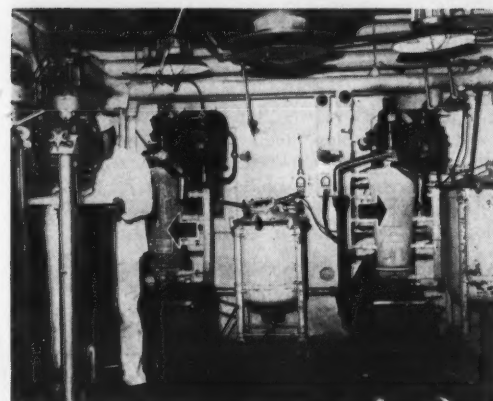
Puts Purification of Blood Plasma Proteins on Commercial Scale

Among products Pitman-Moore Co. is processing at Zionsville, Ind. plant is gamma globulin—hope in battle against polio

ADAPTATION of freeze drying as a step in the separation and concentration of blood plasma proteins represents a unique chemical engineering contribution toward promoting the production potential of these substances. The contribution is a noteworthy one because of the importance of these materials in preventing and treating infections and blood deficiencies. One of the blood plasma proteins

— gamma globulin — has become a ray of hope in the fight against the paralytic form of poliomyelitis. By means of such freeze-drying installations as your Editors had occasion to inspect at Pitman-Moore Co.'s Biological Laboratories at Zionsville, Ind., the processing of human blood has advanced from a laboratory procedure to an industrial scale.

Comprising four Stokes units, the installation at Pitman-Moore is believed to be one of the largest custom-built freeze-drying assemblies in the country. In manufacturing gamma globulin, Pitman-Moore employs freeze drying to drive off ethyl alcohol which is added during initial processing steps. Conventional methods cannot be used, because gamma globulin is heat sensitive and is destroyed by even



Separation of gamma globulin protein fraction occurs in this room which is maintained at 21.2°F. Operator at left stands by tank where blood plasma is mixed with ethyl alcohol. Arrows indicate refrigerated centrifugals which separate out paste-like protein fraction during process

low-temperature boiling. However, the alcohol must be removed to make the serum suitable for injection. It is at this point that freeze drying enters the picture.

Process

In brief, manufacturing procedure involves precipitating out the gamma globulin fraction from human plasma under proper conditions of: temperature (21.2°F), alcohol concentration, acidity, and ionic strength. Resultant precipitate is separated from the solution in refrigerated centrifugals. Final pure protein precipitates in the form of a paste containing some alcohol-water mixture are brought into solution



During first part of freeze-drying cycle, gamma globulin is subjected to temperatures as low as -40°F in this room

in the cold, sharp frozen, and then dried in the Stokes units.

During the first part of the freeze-drying cycle, the material is subjected to a temperature of -40°F, under a pressure of 100 microns or less.

In the final phase it is subjected to mild heat while still under high vacuum, and the final traces of

ethanol and water are driven off without denaturation of the gamma globulin.

After it has been purified by freeze-drying, the dried gamma globulin is restored to liquid form, sterile filtered, filled into bottles and stoppered. It is then ready for shipment to the national pool of gamma globulin which has been established by the National Foundation for Infantile Paralysis.

Equipment

The four Stokes units may be operated independently but normally operate in pairs. Each unit will handle about 20,000 bottles of 10 cc capacity — giving a total capacity of 800,000 cc. Units are capable of



Operators loading one of the four freeze-drying units. Ethyl alcohol is driven off from the gamma globulin by applying mild heat under high vacuum conditions

producing and maintaining temperatures of -76° to -112° F. Vacuum drying chambers have shelves 24 x 36", and the complete installation has a total drying surface of approximately 500 sq ft.

There are two independent refrigeration systems for each pair of units. One is intended primarily for freezing the material; the other is designed for cooling the vapor condenser. Both systems use trichloroethylene as the circulating medium which is cooled by ammonia. The two systems are interconnected so that either can be used for freezing the product or for cooling the vapor condenser.

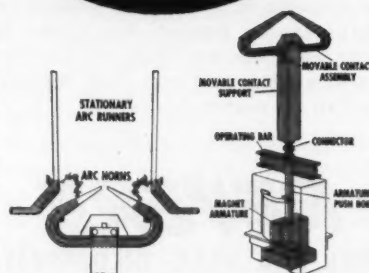
Cooling is accomplished by both a two-stage (22½ ton/24 hr) and a three-stage (47½ ton/24 hr) ammonia system. Former controls the temperature in the drying chamber of the freeze-drying units; the three-stage is connected to the vapor condenser.

Vacuum pumping system for each pair of units is designed with connections to both chambers for both the roughing system and the fine vacuum system. This makes it possible to evacuate either chamber and to hold at as low a pressure as desired. High capacity Stokes "Micro Jet" oil diffusion pumps are backed up by Stokes "Micro Vac" mechanical pumps — there being two mechanical and one diffusion pump on each system.

Emergency Diesel-powered generators are installed

(Continued on next page)

ALLIS-CHALMERS TYPE 256 Air Contactors **CUT Maintenance Cost**



Double-break contacts, vertical action, dual blowout structure and other features speed arc extinction . . . assure long life and low maintenance.

IF YOUR OPERATION demands frequent starting, inching, reversing or plugging . . . if rough repetitive duty plays havoc with contacts and sends maintenance costs skyrocketing . . . you need the Allis-Chalmers Type 256 Air Contactor.

No Turning Shafts — No Shaft Bearings

The elimination of turning shafts, shaft bearings and flexible contact leads minimizes mechanical wear. Double-break contacts of arc resistant alloys, operating in air, straightline vertical action and fast arc extinction add months of contact wear. Actual case histories of "once-a-minute interruption" duty have revealed little contact wear in a full year's operation.

Replacement Units

Compact design permits installation in a cubicle used for oil immersed units in existing starters. And, of course, the Type 256 Air Contactor is also available in Allis-Chalmers Type H Starters.

Call your nearby A-C representative or write for Bulletins 14B7303 and 14B6410. Allis-Chalmers, Milwaukee 1, Wisconsin.



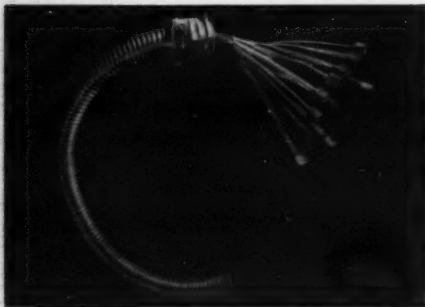
ALLIS-CHALMERS

When inquiring check CP 5224 on handy form, pgs. 2-3

For the new pneumatic instrumentation

Cabled Tube

The recent tremendous increase in the use of tube instead of wires for instrumentation and control purposes has led to an important new development—cabled tube. This is an armored group of long tubes twisted together to permit bending without distortion. An insulating tape is wrapped over the bundle of tubes to prevent electrolytic action. Then interlocking, flexible galvanized steel armor is applied, like BX. This protects the tubes from injury during shipment, storage, installation, and in service. Standard fittings, boxes and cabinets can be used for junction boxes and terminations. To make it possible to readily identify each tube, one tube in each layer is colored; the position of each tube in each layer in relation to the coded tube

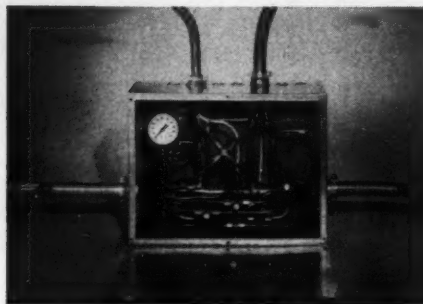


remains the same throughout the length of the cable.

The tubes usually are copper, but aluminum tubes can be used for special purposes. For unusually corrosive situations, a plastic outer sheath can be applied. As many as 19 tubes, $\frac{1}{4}$ " OD, can be cabled, and supplied in lengths up to 1,000 ft.

Showing the construction of Crescent Armored Multitube, made by Crescent Insulated Wire and Cable Co., Trenton 5, N. J., which will supply further information on request.

Since the tubes carry not electricity but air, nitrogen, helium, or a fluid, they are especially attractive in potentially explosive locations, as in refineries and chemical plants. Utilities are also turning decisively to this new cable, while automatic process control (automation) is a rising application.



Revere, as a supplier of tube for this purpose, calls this cabled tube development to your attention as a matter of general and perhaps specific interest. See Revere for copper, aluminum and brass tube and pipe, electric welded steel tube, and lockseam tube. Call the nearest Sales Office.

REVERE

COPPER AND BRASS INCORPORATED

Founded by Paul Revere in 1801

230 Park Avenue, New York 17, New York

Mills: Baltimore, Md.; Chicago and Clinton, Ill.; Detroit, Mich.; Los Angeles and Riverside, Calif.; New Bedford, Mass.; Rome, N. Y. Sales Offices in Principal Cities, Distributors Everywhere
SEE "MEET THE PRESS" ON NBC TELEVISION, SUNDAYS

IDEAS

(Continued from preceding page)

which, in the event of electrical power failure, could operate the refrigeration and vacuum and prevent thaw-backs until high tension line service is restored. Push button controls and warning systems are provided to flash the alarm in the event of power failure or other failures.

In addition to gamma globulin, Pitman-Moore is using freeze-drying to preserve a wide variety of veterinary products including vaccines, antitoxins, sera, and certain other prophylactic and therapeutic biologicals.

(Contributing material to the preparation of this article was the Laboratory Staff of Pitman-Moore Co. at the Zionsville, Ind. plant. Information on the Stokes equipment was received from F. J. Stokes Machine Co., Dept. CP, 5500 Tabor Road, Philadelphia 20, Pa. . . or for more information check CP 5226 on handy form, pages 2 and 3.)



Examining thermocouple protective tube used for protecting thermocouples during production of aluminum.

Through the use of porcelain enamel coating, the life of the tube has been extended from an average of 160 hours for uncoated types to an average of 450-500 hours for coated ones. Additionally, costs of replacing thermocouples have been reduced since a new thermocouple is needed each time a protective tube fails. Thermocouples cost approximately as much as a protective tube.

Tubes are made of cast iron from the bottom to the hot metal line, and plain iron above this line. Cast iron provides the base for the porcelain enamel coating.

In determining the best coating that would extend the life of the protective tubes, some 23 different coating formulations were tried — Barrows #5 proving to be the most efficient.

Coated thermocouple protective tubes are mass-produced by Barrows Porcelain Enamel Company, Dept. CP, Langdon Farm Road at Pennsylvania Railroad, Cincinnati 13, Ohio

When inquiring check CP 5225 on handy form, pgs. 2-3

IDEAS

NBS reclaims asbestos from insulation . . .

recovered material looks good for re-use in insulation

Simple, effective procedures for reclaiming asbestos from discarded pipe insulation have been developed at the National Bureau of Standards. Extraneous material is removed from the asbestos cloth by chemical treatment, and the cleaned cloth is reduced to fiber form in a beater. Recovered asbestos is unchanged chemically, and there is little or no shortening of the fibers. It appears well suited to further use as electrical and heat insulation, for making asbestos paper, and as a filler in various molded plastic compounds.

Asbestos cloth or asbestos-cotton fabrics other than those containing paint can be freed of adhering cement by first treating with 5% HCl and then rinsing. Fabrics painted on one side are treated with alkali instead of acid to remove the paint as well as the cement from the material.

This is accomplished by boiling in 5% NaOH for 15 to 30 minutes, followed by preliminary rinsing, a warm wash with a synthetic detergent to remove paint pigments, and a final thorough rinsing which completes the job.

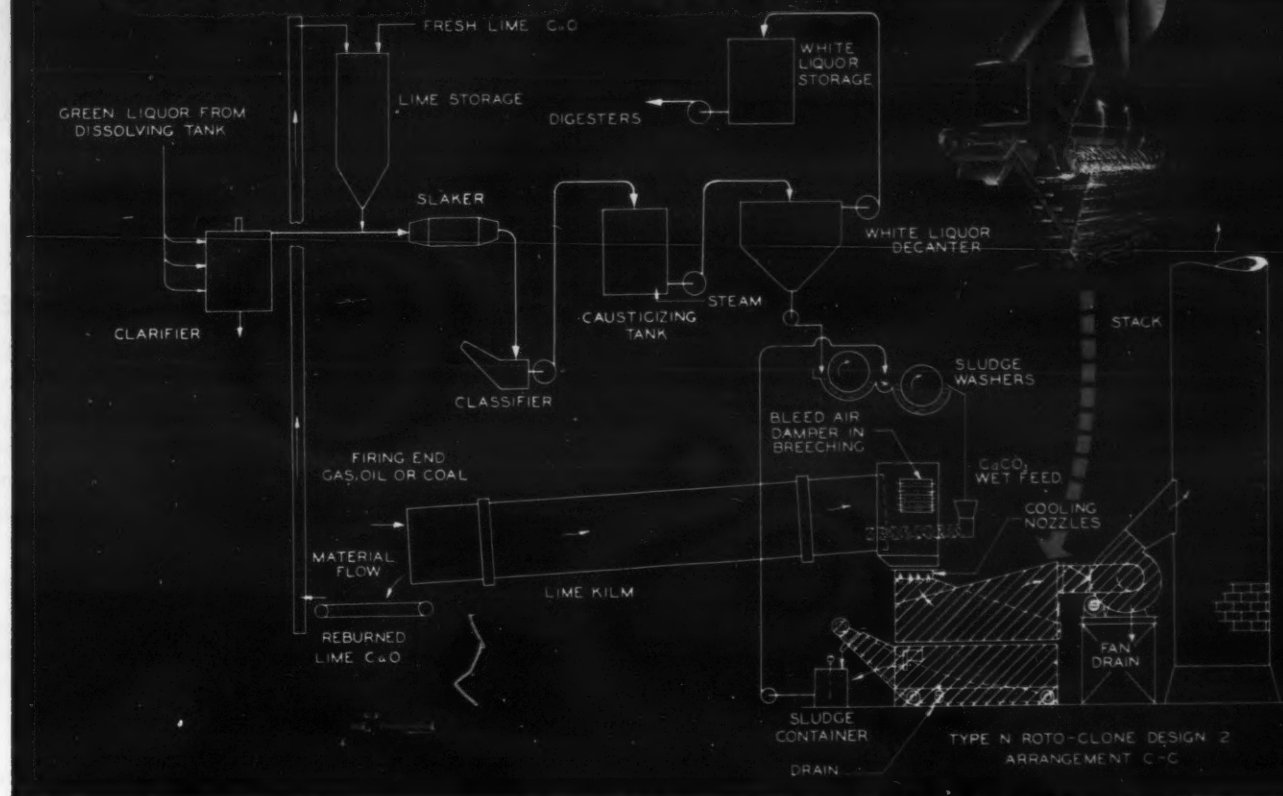
Cotton is removed from the cleaned cloth by heat, but care must be taken to prevent overheating to the point where the asbestos loses its water of constitution and becomes brittle. Thin layers are heated in a muffle furnace at 400 to 450°C. Finally, the cloth is reduced to fiber in a rotary food blender or paper-pulverizer.

Asbestos fabric containing glass strands may have short asbestos fibers, and removal of dirt is difficult since the short fibers tend to float off with the dirt.

(Information on reclaimed asbestos is provided through the courtesy of National Bureau of Standards, United States Department of Commerce, Washington 25, D. C.)

For more information on product at right, specify CP 5227 . . . see information request blank between pages 2 - 3.

BLUEPRINT FOR PROFIT!



Type N Roto-Clone Arrangement C—cutaway shows automatic sludge ejector and distinctive water curtain created by air flow.

Type N Roto-Clone Converts Stack Gas Nuisance into Cold Cash and Goodwill

Lime kiln stack gas losses cost kraft pulp mills plenty. Up to 156 pounds of lime per ton of pulp will be lost up the stack with the resulting dust causing both expensive equipment repairs and neighborhood nuisances.

With the installation of the Type N Roto-Clone* dust-control system, as shown above, lime losses have been reduced to 15 pounds per ton. What's more, the dust threat to costly mill motors has been eliminated along with neighborhood complaints. This is just one example of many in the chemical, rock products and mining industries where Roto-Clone's high cleaning efficiency has both eliminated a dust nuisance and salvaged valuable materials. Exhausting kilns, dryers, roasters and coolers—all involving heavy loads of fine dust at high temper-

atures—are the kind of tough jobs welcomed by the Type N Roto-Clone.

Reason for the Type N's success? It's a hydro-static precipitator. Combined action of centrifugal force and a thorough intermixing of water and dust-laden air result in high cleaning efficiency. It is unaffected by high temperatures, can't clog and the dust is collected as sludge for easy reprocessing or disposal.

Get the complete Type N Roto-Clone story now! See your nearest AAF representative or write for Bulletin No. 277. Convert that dust nuisance into goodwill—and dollars.

*ROTO-CLONE is the trade-mark (Reg. U. S. Pat. Off.) of the American Air Filter Company, Inc., for various dust collectors of the dynamic precipitator and hydro-static precipitator types.



American Air Filter

COMPANY, INC.

258 Central Avenue, Louisville 8, Kentucky

American Air Filter of Canada, Ltd., Montreal, P. Q.

• Pacific Division Office, San Francisco, California

Construct world's fastest digital computer—call it ORACLE . . .

addition of two 12-digit decimal numbers takes place in about 5/1,000,000 of a second

Construction and operation of the world's fastest general purpose digital computer was announced in August by Argonne National Laboratory. The computer, known as the ORACLE (Oak Ridge Auto-



Mr. J. C. Chu, Argonne senior scientist in charge of the design and construction of the ORACLE, observes the operation of its arithmetic unit which is illustrated by the light of its 2000 electronic tubes

matic Computer, Logical Engine), was designed and constructed at Argonne by a staff of engineers from Argonne and Oak Ridge National Laboratory under the direction of J. C. Chu. It will be installed at Oak Ridge early this Fall where it will be used by the ORNL mathematical panel under the direction of Dr. A. S. Householder.

The new computer, which was built at a cost of \$350,000, contains three features which make it superior to other computing devices. First, its internal memory system has the greatest capacity of any high-speed general-purpose computer ever built. It can receive, retain and process as many as 2048 twelve-digit decimal numbers. Second, the ORACLE is provided with a remotely-controlled auxiliary memory system which provides for the memorizing or storing of four million words. (One word is equivalent to one 12-digit decimal number.) This is the largest memory system ever contemplated for a computer. Third, the ORACLE is the fastest of the general-purpose computers. It can multiply 12-digit numbers such as 999,999,999,999 by 999,999,999,999 in less than 1/2000 of a second. (Argonne's AVIDAC computer described in May CHEMICAL PROCESSING did this operation in 1/1000 of a second). Addition of two 12-digit decimal numbers takes place in about 5/1,000,000 of a second.

Design of ORACLE's internal memory unit represents a departure from the design of Argonne's AVIDAC and from that of most computers. The

TWELVE MONTHS OF P

NATIONAL CARBON'S GREATEST YEAR OF PRODUCT DEVELOPMENT BOOSTS THE BUYING POWER OF YOUR EQUIPMENT DOLLAR

Here is recommended reading for those who want a dollar that will buy *more* instead of *less* than a year ago. These catalog pages detail the results of the most intensive

product-development program in our history — man-hours and money devoted to adding value *in every way possible* to your new "Karbate" impervious graphite equipment.

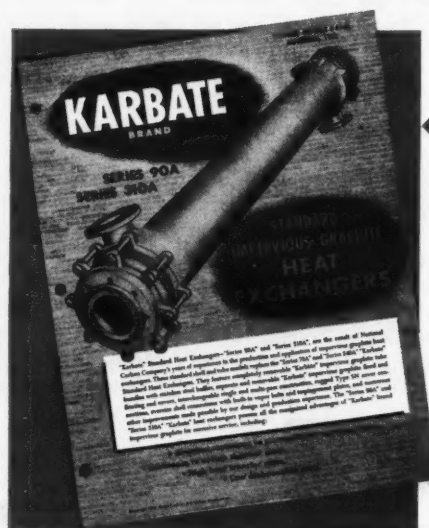
HERE'S WHAT WENT INTO THE PROGRAM:

- A material unique in corrosion resistance
- Design know-how and facilities pre-eminent in the field
- Application experience of long standing

HERE'S WHAT CAME OUT OF THE PROGRAM:

- Higher unit capacities
- Lower costs per unit of product through increased efficiency
- Still greater ease of installation and maintenance
- Increased ruggedness and flexibility
- Greater simplicity and alterability than ever before

SEE THEM AT THE CHEMICAL SHOW • NOV. 30 — DEC. 5
CONVENTION HALL, PHILADELPHIA, PA.

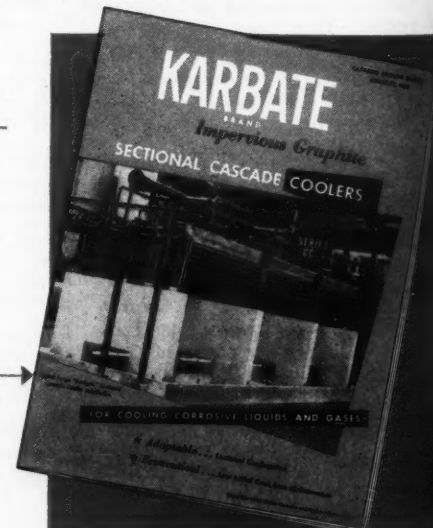


Catalog Section S-6740— HEAT EXCHANGERS

Chemical resistance to practically all corrosive fluids; resistance to severe thermal shock; high heat-transfer rates; low maintenance costs.

Catalog Section S-6820— CASCADE COOLERS

Low initial cost; radiused returns for low pressure drop; redwood water-guide strips; three standard models in stock.



OF PROGRESS IN VALUE!

IDEAS

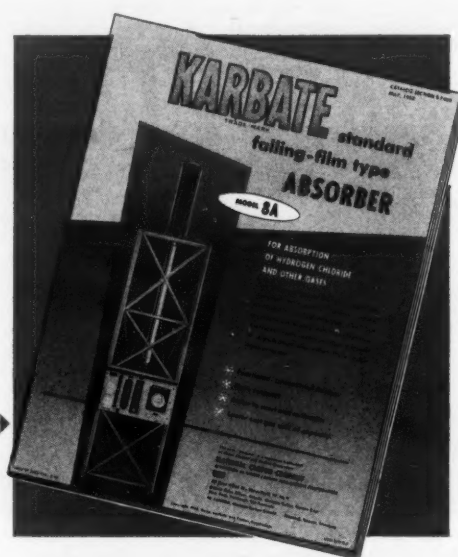


Catalog Section S-7460 - HCL ABSORBER

Produces up to 20 tons per day 22° Baumé Acid; pneumatic automatic control; compact, lightweight; minimum installed cost.

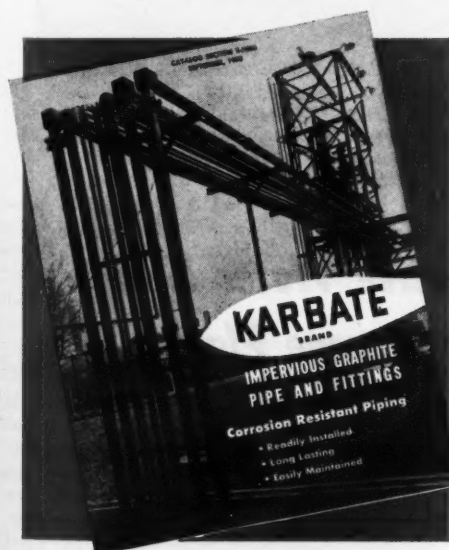
Catalog Section S-7250 - CENTRIFUGAL PUMPS

Capacities from 5 to 1500 G.P.M.; type SN armored connections; pump efficiencies to 60%; discharge pressures to 100 psi.



Catalog Section S-7000 - PIPE AND FITTINGS

Readily installed; long lasting; easily maintained; unaffected by most corrosive fluids.



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When inquiring check CP 5228 on handy form, pgs. 2-3



One of the 40 plug-in units of the ORACLE's memory system is replaced by staff member. Each packaged unit contains two 3" cathode ray tubes and 22 small electronic tubes which are used the amplifying and switching circuits. By the use of packaged units, repairs to the memory unit are accomplished with a minimum of shut-down time

internal memory unit consists of 40 separate plug-in units, each of which contains two 3" cathode ray tubes and 22 small electronic tubes which are used in the amplifying and switching circuits. By the use of packaged units, repairs to the memory unit are accomplished with a minimum of shut-down time and inconvenience.

To further speed the replacement of a defective unit, 3 extra memory units are connected to the system and thereby kept in a handy "warmed-up" condition.

(Information courtesy of Argonne National Laboratory — Operated by the U. of Chicago for the U. S. Atomic Energy Commission — P.O. Box 299, Lemont, Ill.)

Packaged automatic control for atomic piles

First packaged automatic control system to monitor the operation of atomic piles and their related processes has been successfully designed. A completely integrated control unit, the system will include a multiplicity of electronic instruments — amplifiers, servo-amplifiers, recorders, controllers, and servomotors. These will automatically regulate the rate of power generation of the nuclear reactors at predetermined levels. Essentially this is done by automatically regulating the reactor's control rods, which are analogous to an automobile throttle. Accessories are also included in the control system.

The new system also provides robot-like safeguards against dangerous operating conditions.

(Summary of information received from the Minneapolis-Honeywell Regulator Company, Industrial Division, Dept. CP, Philadelphia, Pennsylvania.)



faster cleaning For STAINLESS STEEL EQUIPMENT

If quick cleaning is one of the factors that determines your use of stainless steel processing equipment, remember this:

A STAINLESS STEEL VESSEL WITH ROUND CORNERS CLEANS FASTER—MORE THOROUGHLY—THAN ONE WITH SQUARE CORNERS. Whether you clean with brush or cloth—you can "get at" all the surfaces of a round-cornered vessel easily. There are no corners in which residue can hide.

Having worked exclusively with stainless steel and alloys for many years, we have developed to a high degree the techniques needed to fabricate processing equipment with round corners.

Using tools and dies of our own design, we build your vessels so that cleaning time in your plant is cut to a minimum. Result: your stainless steel equipment costs less to operate and lasts longer. Consult with us.

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Guards Alloys in Fabrication

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SEND FOR THIS VALUABLE BOOK
A request on your letterhead will bring our "What to Look For When You Specify Stainless Steel for Your Processing Equipment."



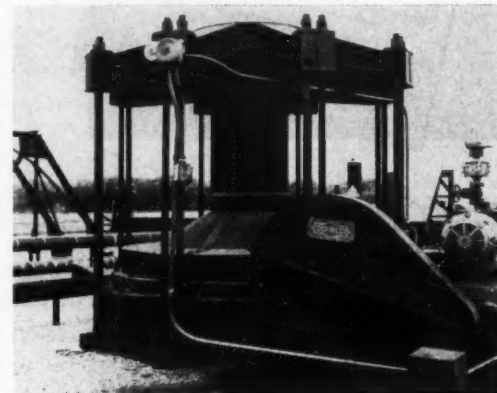
These motors and engines operate pumps in pump room which receives sewage from the city of Fond du Lac, Wis. The internal combustion engines use gas from sludge digestion as fuel



Water overflowing from clarifier. Concrete coating used on these water-line surfaces must withstand not only weathering but also the erosive action of the flowing water



Detritor (foreground), clarifiers and rock filters (background) of Fond du Lac's modern sewage treatment plant. Concrete and metal surfaces are exposed to rust and corrosion



Metal surfaces atop sludge digester are covered with bituminous coating. Electrical conduit here is badly rusted on surface, but coated metal is in excellent condition, despite presence of sulfide gases

Weather, Corrosive Gas, and Erosive Water Flow Test Protective Coat at Modern Sewage Plant

Bituminous covering has preserved outdoor concrete and metal surfaces for more than three years

SEVERAL interesting innovations are included in the 1950-completed sewage treatment plant and garbage incinerator of the city of Fond du Lac, Wis. For one thing, digested sludge, after filtration on rotary vacuum filters, is dried in a

flash drying system which uses hot gases from the garbage incinerator as a means of drying. The dried sludge is sold as fertilizer.

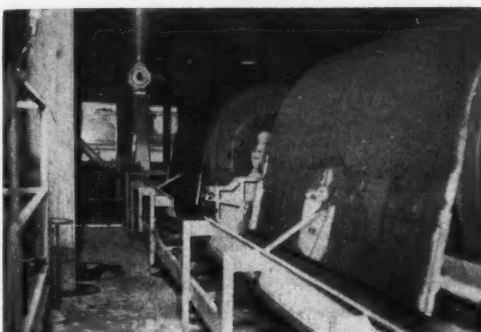
Another instance of good utilization of by-products: gas given off during anaerobic digestion of the sludge (relatively high in methane) is used for heating the plant and for running the internal combustion engines on two of the four pumps that move incoming sewage from wet well into the treatment process.

The disposal plant has a capacity capable of treat-

When inquiring check CP 5229 on handy form, pgs. 2-3



Floating roof of final sludge digester and gas holder is protected by bituminous coating. Sludge line shows how far down the roof sinks when gas is low. Coating under the sludge is intact



Sludge from digesters is given chemical treatment and then dewatered on two Eimco rotary vacuum filters. Cake falling from drum surfaces is carried by conveyor belt to Combustion Engineering flash drying system, part of which is in background

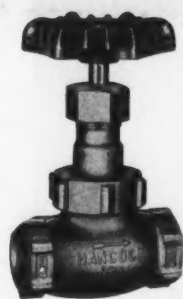
ing waste from a population of 77,500 people (estimated for 1970), and dry weather flow should then be about 7,200,000 gpd. Dry weather flow is now about $3\frac{1}{2}$ million gpd, close to one-third of which consists of wastes from a tannery. This waste is treated together with other city sewage after it has been screened to remove hair and fleshings. Total wet weather flow to the disposal plant has been known to rise as high as twenty-two million gpd.

Corrosion Prevention

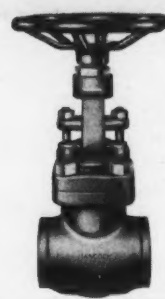
While conditions in and about the plant are not as corrosive as a good number of chemical processing operations, there are locations where the combination of sulfide gases, moisture, and weathering can cause trouble. One bad spot is the metal and concrete surfaces at water level in the clarifiers, flocculators, rock filters, and other similar equipment. Here, there is apt to be some erosion from the flow of the water and sewage, too.

The floating metal roof of the final digester and gas holder is another spot where trouble could become chronic. The roof, as it goes up and down in accordance with the amount of gas being generated and stored, may be exposed at one hour to sludge

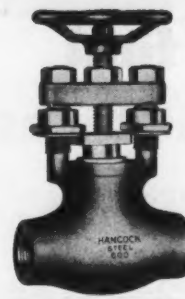
(Continued on next page)



150#, 200# and 300#
Bronze Globe, Angle and
Check Valves



800# Steel Gate Weldvalves



600# Steel Globe and Angle
Weldvalves

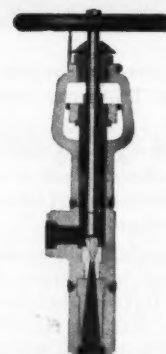


1500# and 2500# Steel
Globe and Angle Weldvalves

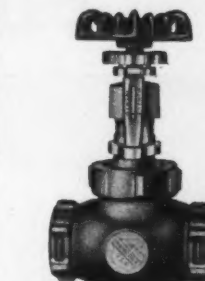
There's a
HANCOCK VALVE
FOR YOUR TOUGHEST
SERVICE REQUIREMENTS

Illustrated are some of the many fine Hancock Valves that contribute substantially to the high efficiency of plant operation and the low cost of valve maintenance. By anticipating the changing needs of expanding industry, Hancock has — since 1877 — pioneered the development of many different types of valves. Today, the outstanding quality and superior performance of Hancock Valves continue to surpass practically every job requirement, regardless of the demands of service. Yet, despite their long, trouble-free life, Hancock Valves cost no more than ordinary valves.

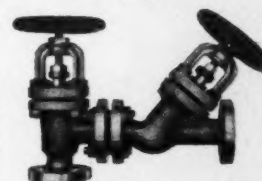
**When Hancocks go in,
valve costs go down**



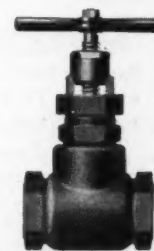
600# through 1500#
Hi-Pressure Drop Weldvalves



150# and 300# Bronze and
600# Steel "Flocontrol"
Valves



300#, 600#, 1500# and
2500# Boiler Blow-Off Valves



300# and 600# Cast Steel
Globe, Angle and Check Valves

FAST SERVICE IS YOURS through your nearby Industrial Supply Distributor. He stocks a wide selection of Hancock Valves to meet the diverse requirements of all industry. You can rely on his recommendations to help you obtain the best valves for your applications.

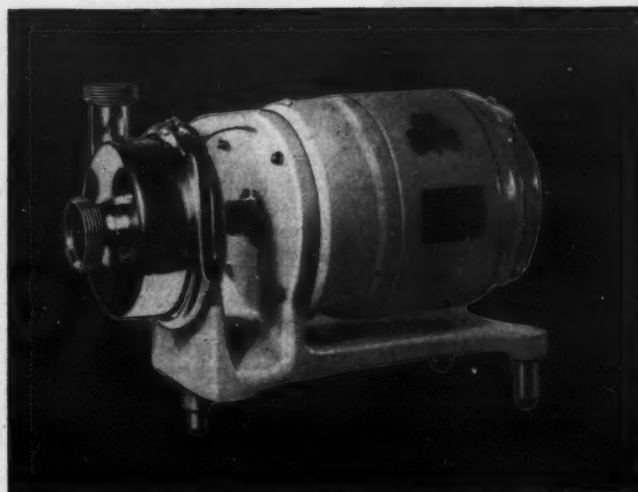
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A product of **MANNING, MAXWELL & MOORE, INC.** Watertown 72, Massachusetts

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When inquiring check CP 5230 on handy form, pgs. 2-3

You'll find all the features you want in TRI-CLOVER PUMPS



OVER 30 years of continuous improvement is embodied in today's line of Tri-Clover centrifugal pumps.

The "Pump King" Sanitary Series—the Standard Sanitary Series—and the Industrial Series—all have exclusive Tri-Clover pump features that mean better, more efficient liquid transmission.

Patented screw type impeller with sanitary impeller clip—inert carbon seal that is easily removed and cleaned—streamlined, lightweight head with a minimum number of parts—simple, fast pump assembly and disassembly with the new Ring Clamp construction—these are just a few features that make Tri-Clover Centrifugal Pumps ideally suited for food, chemical, dairy, and industrial requirements for sanitary and corrosion-resistant service.

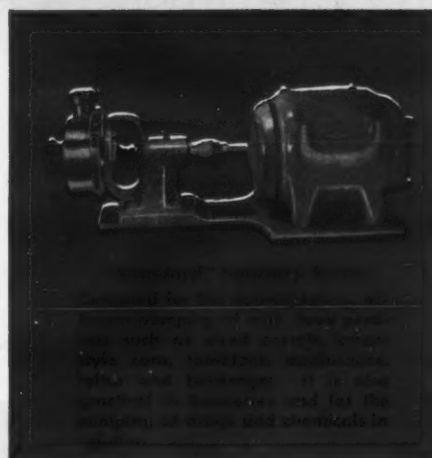
Benefit from these important advantages when looking for a solution to your pumping problems.

See your nearest Tri-Clover distributor.

P-153

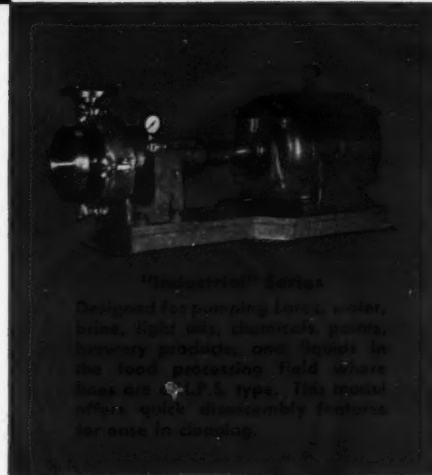
EXPORT DIVISION

8 So. Michigan Ave., Chicago 3, U.S.A.



"Pump King" Unimount Series

Designed for very efficient operation at 1800 and 3600 RPM, and especially where high speeds are required, through heaters, coolers, filters, clarifiers, etc. The 3600 RPM model is especially applicable in the dairy industry where high head and low capacity are essential and for handling low and medium viscosity liquids in the food processing industry.



"Industrial" Series

Designed for pumping acids, alkalis, brines, light oils, chemicals, paints, brewery products, and liquids in the food processing field where there are no L.P.S. type. This model offers quick disassembly features for work in cleaning.

Tri-Clover
MACHINE CO.

Kenosha, Wisconsin

TRI-ALLOY AND STAINLESS STEEL
SANITARY FITTINGS, VALVES,
PUMPS, TUBING, SPECIALTIES

THE Complete LINE

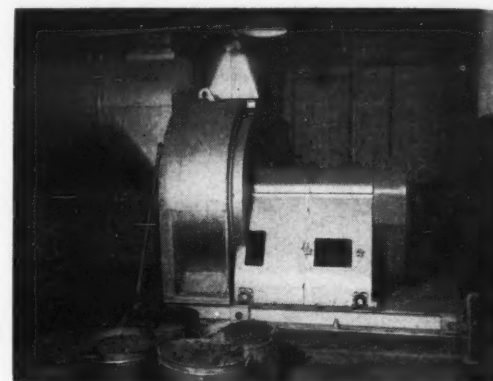
FABRICATED STAINLESS STEEL
INDUSTRIAL FITTINGS AND
INDUSTRIAL PUMPS

IDEAS

(Continued from preceding page)

and sludge gases, and the next to rain, snow, or sun. Other metal surfaces atop the digesters are also subject to corrosion from weathering and gases even though they don't have as severe conditions to fight.

When the plant was built, these potential trouble spots were protected with a bituminous paint (Americote). This material is quite elastic so that it can stand the expansion and contraction of the coated surface without breaking. It will adhere to any surface, sets in 3 to 5 hours, and dries in about 24 hours. It resists the effects of waters, acids, alkalis, and salt.



Cage mill where dewatered sludge is intimately mixed with hot gases from garbage incinerator. Dried product from cyclone collector of flash drying system is bagged and sold as fertilizer

At Fond du Lac, the original coat still suffices on most surfaces. A second coat has been applied to some metal surfaces where conditions are especially severe. Plant was completed in October of 1950.

(The Editors thank Mr. Clarence W. Bogenhagen, superintendent of Fond du Lac's modern facilities, for his assistance in preparation of this story.)

(Americote is a product of The American Oil & Paint Co., Dept. CP, 9915 Harvard Ave., Cleveland 5, Ohio . . . or for more information check CP 5232 on handy form, pages 2 and 3.)

Users of air compressors offered "stand-by" emergency service

Nation-wide plan to save users of air compressors high costs and operating losses resulting from sudden failure of their equipment has been announced. Firm offers "stand-by" replacement equipment, promptly installed on a short-term rental basis for period required to repair or replace original air compressors.

(Service is offered by Air Compressors and Motors, Inc., Dept. CP, 13710 Aspinwall Ave., Cleveland, Ohio. . . or for more information check CP 5233 on handy Reader Service slip located between pages 2 and 3.)

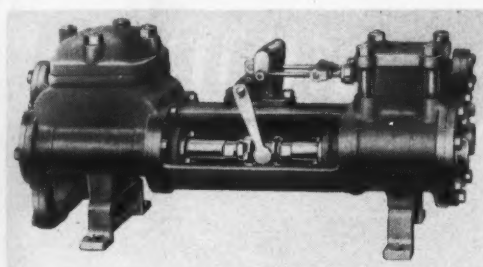
When inquiring check CP 5231 on handy form, pgs. 2-3

Low operating costs, flexibility make steam pump appear to be only unit for many uses . . .

can be operated without oil lubrication if steam is saturated

Although the first steam pump was built many years ago, it is still the best unit for many applications due to its low maintenance costs and flexibility of operation.

In selecting a pump, it is worthwhile to inspect plant facilities and consider if steam is being wasted in any way. Reduction of high pressure steam to low pressure for use on process work may be taking



General service duplex cap and valve plate steam pump for pressures up to 350 psi

place. If this is the case a steam pump, such as the typical unit shown in accompanying illustration, can be used to reduce pressure with only a slight loss of steam and heat content. Hence, the work of the pump can be considered almost free.

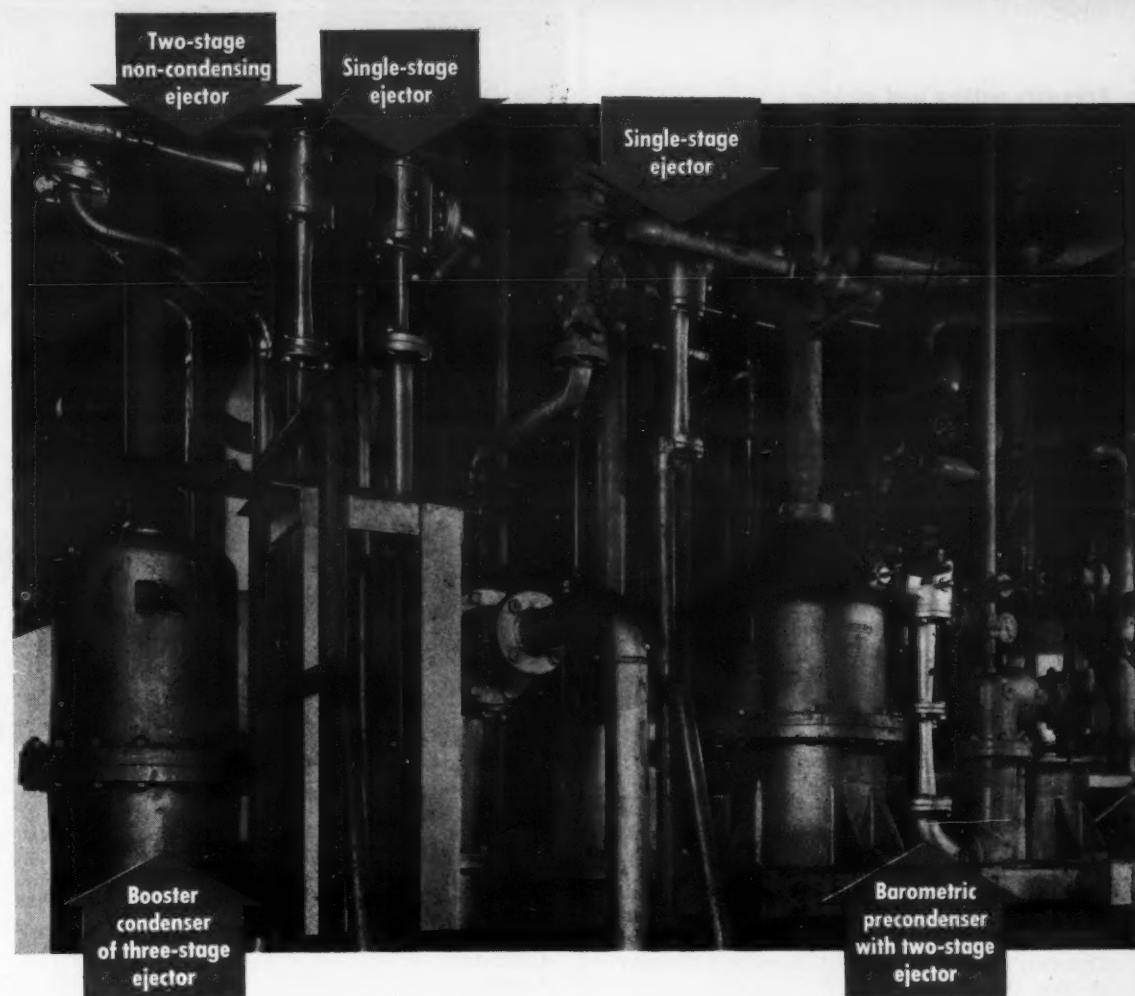
The steam pump is so flexible that the capacity and pressure can be varied over a wide range by merely changing the position of the steam inlet valve manually or by automatic controls. It can also handle liquids of very high viscosity with little extra power required.

Its versatility is substantiated by the petroleum industry's continued use of steam pumps where many of their services require varying capacities, pressures, and viscosities to be handled by one pumping unit.

Exhaust steam from a steam pump can be condensed and returned to the boiler. However, when exhaust steam is used in this way, oil used for lubrication in pump may carry over into boiler. For most boiler feed service where the steam pump is applicable, an oil content of one-third of a grain per gallon is satisfactory and oil separators can reduce oil content to this extent. Where even a slight trace of oil in steam is objectionable, the steam pump can be operated satisfactorily without oil lubrication if the steam is saturated.

Although the word "steam pump" implies that the unit is driven by steam, this type of pump can also be driven by air or non-corrosive gas. Many users find it to their advantage to use air to drive pump when it is used for portable utility service.

(From information submitted by C. William Kain, Application Engineer, Worthington Corp., Dept. CP, Harrison, N. J. . . . or for more information check CP 5234 on handy form, pages 2 and 3.)



For VACUUM any way you want it-

ELLIOTT *Steam Jet* EJECTORS

Oil processing, for instance, may call for a variety of absolute pressures, in various ejector arrangements and sizes, with or without condensers. The photo above shows how the adaptability of Elliott ejectors, plus the "know-how" of Elliott ejector specialists, met the need in the plant of a nationally famous producer of edible oils. Processes included drying, hydrogenation and deodorizing.

If you have a condition requiring vacuum, the cooperation and experience of Elliott engineers, at your command, may be the short way to meet it. Contact your local Elliott representative or write Elliott Company, Jeannette, Pa. for descriptive bulletins.

ELLIOTT Company

STEAM TURBINES • MOTORS • GENERATORS • DEAERATING HEATERS • EJECTORS • CONDENSERS • CENTRIFUGAL BLOWERS • TURBOCHARGERS • TUBE CLEANERS • STRAINERS

G3-4

INDUSTRIAL PROCESS DIVISION



When inquiring check CP 5235 on handy form, pgs. 2-3

Prevents galling and sticking of nuts and bolts in boiler equipment

Metal parts held tightly together for a long time are hard to separate. In the operation of boilers, where heat and moisture create an oxidizing atmosphere, this tendency to stick together is aggravated.

To prevent bolts, nuts and flanges from galling and seizing under the extremely high temperatures and pressures encountered in boiler equipment, a concentrated dispersion of colloidal graphite in oil is used to paint threads of bolts and other fittings before equipment is assembled, or during maintenance work.

Graphite coating formed by product, called 'Oildag', is unaffected by temperatures of nearly 1000°F, according to the results of tests. It is reported that not only does graphite retain its low coefficient of friction under such circumstances, but it also resists oxidation and acts to inhibit corrosion.

('Oildag' is a product of Acheson Colloids Co., Div. of Acheson Industries, Inc., Dept. CP, Port Huron, Mich. . . . or for more information check CP 5236 on handy form, pages 2 and 3.)

Washable flameproof cotton . . .

chemical treatment remains effective through repeated launderings

Improved flameproofing of cotton fabrics, using a chemical treatment that remains effective in the cloth through repeated launderings, was announced recently by the Bureau of Agricultural and Industrial Chemistry's Southern Regional Research Laboratory in New Orleans.

Cotton goods finished by the new process will char if subjected to fire, but they won't burst into flame and have no smoldering afterglow.

The treated fabrics retain their flameproofness after more than 15 launderings, a very severe test for this type of chemical finish. They should be useful, the laboratory scientists believe, for curtains, draperies, upholstery, bedding, and other cotton textiles in which flame resistance has high safety value.

This finishing method, developed by W. A. Reeves and J. D. Guthrie, is the latest of several flameproofing processes now under study at the Southern Laboratory in research to improve various properties of cotton fiber, yarn, and cloth.

Development of flameproofing finishes for cotton fabrics was undertaken by the laboratory in cooperation with the Army Quartermaster Corps, which is greatly interested in flameproof military clothing. Battle experience with incendiary weapons has shown the need for improved flameproofing of fabrics for military use. This is recognized by the armed services as one of their major textile problems.

Chemicals used in the Southern Laboratory's new treatment are 1) methylolmelamine, already employed widely for creaseproofing fabrics; 2) urea, a common industrial chemical; and 3) a phosphorus-containing compound, tetrakis (hydroxymethyl)

Having trouble with shipping these products?

It's time to consider tank cars of aluminum.

Acetaldehyde	Hydrogen Peroxide
Acetic Acid	Inks, Rotogravure
Acetone	Lacquers
Acrylonitrile	Methyl Alcohol
Ammonia, Aqua	Naphtha
Ammoniacal Liquor	Nitric Acid
Ammonium Thioglycolate solution	(above 82% concn.)
Amyl Acetate	Nitrogen fertilizer solutions
Benzaldehyde	Nitro Paraffins
Benzene (Benzol)	Oil
Benzyl Alcohol	Castor
Butyl Acetate	Coconut
Butyl Alcohol	Cottonseed
Butyric Acid	Fish
Butyric Anhydride	Pine
Carbon Bisulfide	Soybean
Corn Syrup	Tall
Cottonseed Oil	Vegetable
Ethyl Alcohol	Paraldehyde
Ethyl Aniline	Phenol
Ethylene Glycol	Phthalic Anhydride
Ethylene Glycol Monoethyl Ether Acetate	Propionic Acid
Formaldehyde	Propionic Anhydride
Furfural	Pyridine
Glucose Syrup	Toluene
Glycerin	Toluidine
Glyceryl Phosphate	Turpentine
	Urea Ammonia Liquor

. . . and aluminum tank cars cost a third less than stainless steel tank cars.

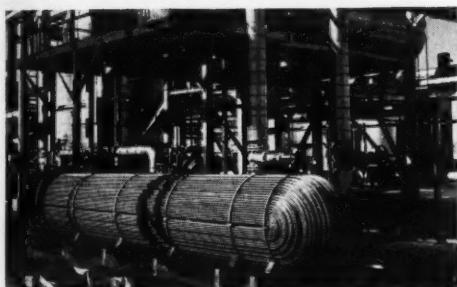
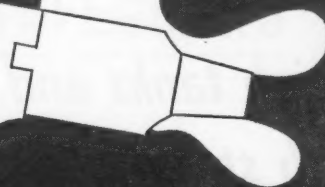


If you are shipping liquid ladings such as these, tank cars made of ALCOA Aluminum offer you very real cost-cutting advantages. Aluminum does not contaminate or discolor sensitive liquids—does not promote decomposition. Result: *no damage to ladings, better end products.* Aluminum is highly resistant to most corrosive ladings—requires far less maintenance than other metals.

Write today concerning the compatibility of your commodity in aluminum tank cars. Remember, Alcoa pioneered the aluminum tank car years ago. The accumulated knowledge of this development is yours for the asking.

ALUMINUM COMPANY OF AMERICA
902-M Alcoa Building, Pittsburgh 49, Pa.

in the process



Griscom-Russel Re-boiler at El Paso Natural Gas Company, Farmington, New Mexico.

Got corrosion troubles?

So did El Paso Natural Gas Company's desulfurization plant near Kirtland, New Mexico, world's largest gas treating plant. Alloy steel tubing could not withstand the terrific acid conditions there. Result: to minimize this trouble, condenser and heat exchanger tubing throughout the plant is being replaced by aluminum.

Got cost troubles?

Alcoa Heat Exchanger Tubes cost 1/3 less than mild steel, 1/2 the price of Admiralty, 1/5 as much as stainless. Write for the booklet: "Alcoa Aluminum Heat Exchanger Tubes."



"See It Now" with Edward R. Murrow . . . CBS-TV every Tuesday . . . brings the world to your armchair. Consult your newspaper for local time and channel.

Looking for low-cost, corrosion-resistant pipe?

Alcoa Aluminum Pipe is the lowest cost corrosion-resistant metal pipe. Will not contaminate or discolor most chemicals. Does not cause sludge or gum in petroleum products. Ideal for railings, scaffolds, racks and other structural uses, especially in corrosive industrial atmospheres. Write for the booklet: "Alcoa Aluminum Pipe."

Don't forget corrosion-resistant sheet, plate, paint, Utilitube and shipping drums of Alcoa Aluminum. See our advertisement in Chemical Engineering Catalog.

Alcoa Aluminum



ALUMINUM COMPANY OF AMERICA

When inquiring check CP 5237 on handy form, pgs. 2-3

phosphonium chloride, known as THPC and now available in limited quantities for experiment.

These compounds are applied with standard textile equipment. The process is similar to commercial methods used in creaseproofing cotton. After treatment with a solution of the chemicals, the fabric is dried, cured for a few minutes at 285°F, then washed and again dried.

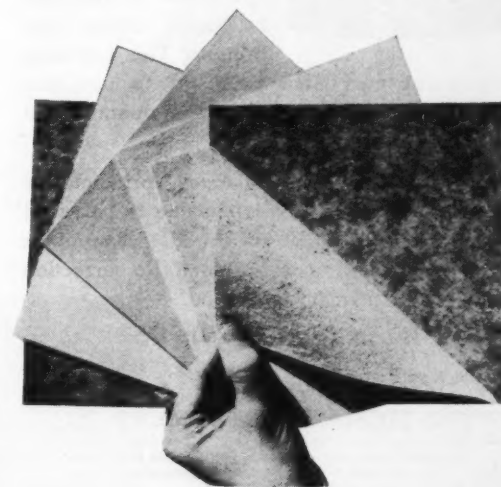
The new method of flameproofing will cost a little more than some of the less permanent processes now in commercial use. Large-scale production of THPC is considered feasible, and the chemical should be relatively inexpensive to manufacture.

Information on the improved treatment and small samples of fabrics flameproofed by this process are available from the Southern Regional Research Lab.

(Taken from Vol. I, No. 3, May-June 1953 issue of "Agricultural Research", Agricultural Research Administration, United States Department of Agriculture, Washington 25, D. C.)

Glass papers finding specialty uses

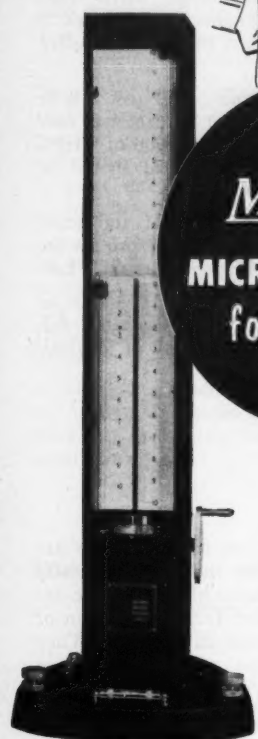
Papers made of extremely fine fibers of glass are being used in a variety of industrial specialty applications. These incombustible, inorganic industrial papers are being used for the filtration of hot and/or corrosive air, gases, and liquids. They are also finding application as base sheets in



specialty electrical laminates, as gasketing material, and as plate separators in aircraft and other special batteries. In such applications, the inherent high temperature resistance and excellent electrical-chemical properties of the product are very desirable. Many other possible uses are visualized, but have yet to be explored.

(Fibrous glass in its wool form is offered to paper makers by the Owens-Corning Fiberglas Corporation, Dept. CP, Toledo 1, Ohio.)

for Calibration,
Precision Indicating...



MERIAM
MICROMANOMETER
for Readings
to .001"

Here is the answer to many of those calibration problems! Accurate and easy to use — by even the inexperienced — this highly sensitive Meriam Micromanometer is designed for highly critical calibrations. This precision instrument may also be used to indicate differential pressures in systems operating at static pressures up to 15 psi.

Utilizing the "null balance" principle of operation, a known pressure value is balanced against the value to be measured. All readings are made at a zero reference point. No correction for fluid displacement is needed.

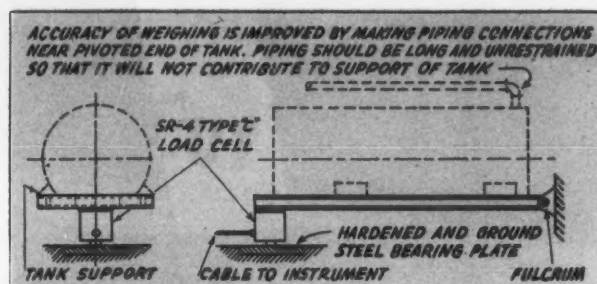
Write for Bulletin 25.

THE MERIAM INSTRUMENT CO.
10940 Madison Avenue • Cleveland 2, Ohio
WESTERN DIVISION: 4760 E. OLYMPIC BLVD., LOS ANGELES 22, CALIF.
IN CANADA: PEACOCK BROS., LTD., MONTREAL

MERIAM ★
★ *Instruments*
ESTABLISHED 1911

MANOMETERS, METERS AND GAUGES FOR THE ACCURATE MEASUREMENT
OF PRESSURES, VACUUMS AND FLOWS OF LIQUIDS AND GASES

When inquiring check CP 5238 on handy form, pgs. 2-3



weigh tanks and bins with strain gages

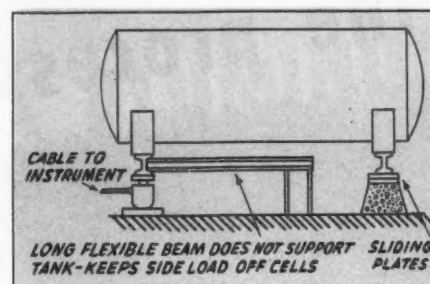
Practical considerations and care in design make simple, permanent weighing systems capable of ending "impossible" control problems

Bonded wire strain gages have gained a good reputation in industrial weighing applications. But because the underlying idea of their use is so simple, it is possible to misapply them. There are several simple precautions which can eliminate possibilities for trouble.

Reason for caution in designing a strain-gage weighing system for tanks, hoppers, or bins is the possibility of measuring extraneous forces applied to the system. Manufacturer recommends that system be designed by experts since, as a rule, unique problems arise in each case. There are, however, obvious sources of trouble.

Isolating the system is essential. Since strain gages read the actual weight applied, loads from piping, wind, guy wires, etc., must be eliminated or held constant. Where only one-half the tank is supported by strain gages, fraction of the weight supported must remain constant. This is facilitated by low deflection of the gage itself — from 0.005 to 0.008 inches under full load.

Another set of similar problems stems from snow



load, condensation of moisture in tank lagging, and similar additions. Care must also be employed where cooling or heating coils change tare weight. Piping connections should be made with long straight horizontal pipes so that stiffness is minimum. Flexible connections can also be used. Minimum lengths of horizontal pipe are given in this table:

Nominal Pipe Size	1"	1 1/2"	2"	3"	4"	5"	6"
Cell Capacity (lb)							
2000	31"	48"	60"				
5000		35"	44"	76"			
10,000		28"	35"	60"	81"		
20,000			27"	48"	64"	83"	
50,000				35"	48"	61"	76"
100,000				28"	38"	48"	60"

Where more than one pipe runs into a tank, this distance must be increased by a factor of the cube root of the number of pipes.

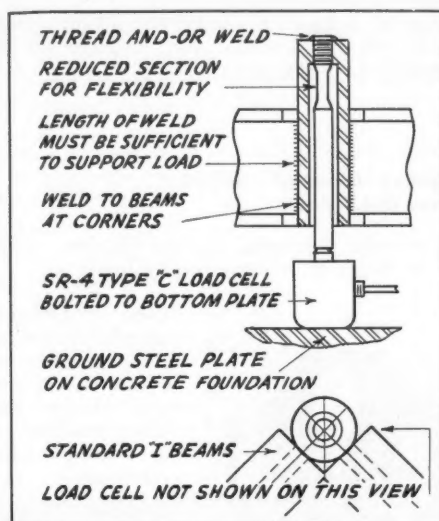
Temperature can also be a factor in accuracy and stability of a strain gage weighing system. While the cells are compensated for variations within a certain range (usually 15 to 115°F), temperature gradients within the cell should be avoided. Where cells are exposed to radiant heat they should be lagged. Temperature of the cell should not be

instrumentation

allowed to exceed 150°F because zero of the cell may change.

Another temperature problem is the side thrust forces on cells which may be generated by dimension changes of the tank or bin. So long as these forces do not exceed 20% of cell capacity they will not damage the cell—but accuracy may be affected. Sketches show schemes which can be used to eliminate side thrust.

Corrosion protection for the cells may be needed because of low carbon steel construction. Cells are



hermetically sealed, however, and can be used in explosion-hazard atmospheres. Associated instruments can be protected from corrosive fumes by purging with low pressure air.

Vibration from mixing or heavy equipment nearby can affect operation. In extreme cases, fatigue life of cells can be decreased by vibration. Only effective "countermeasure" is proper selection of cell type.

(This information is briefed from a technical paper published by Baldwin-Lima-Hamilton Corp., Dept. CP, 942 Simpson St., Philadelphia 42, Pa. . . or for more information check CP 5239 on handy form, pages 2 and 3.)

Photoelectric control in action

Pocket-sized case book illustrates and describes 46 cases in which photoelectric control was used. Paper, plastics and chemical industries are among the 13 singled out for study in the book.

"Cutting Production Costs" is issued by Photo-switch Inc., Dept. CP, 77 Broadway, Cambridge 42, Mass. When inquiring reader may simply specify CP 5240 on handy Reader Service slip between pages 2 and 3.

Here's SK's NEWEST DESIGN for Rate-of-Flow Measurement—the SAFEGUARD ROTAMETER

As an answer to industry's increasing demands for *safety* and *convenience* in rate-of-flow measurement of liquids and gases, SK has designed its newest Rotameter—the Safeguard Rotameter.

This Rotameter has specific application for measurement in the higher temperatures and pressures of modern process technology, or where dangerous or valuable liquids and gases are being used.

FOR SAFETY:

The completely enclosed steel meter case has detachable safety glass windows, protects the metering tube from external shock, and also protects the operator if accidental tube breakage occurs.

FOR CONVENIENCE:

Wider front and rear sight glass windows give maximum visibility. The detachable metal reference scale can be supplied in either units of flow or in millimeters for use with calibration charts, as desired.

Extreme construction rigidity gives precise end fitting alignment, eliminates pipe stresses on the tube.

Can be adapted for remote recording and controlling of fluid rate of flow.

Write for full information, including sizes and capacities, on this newest Rotameter design.

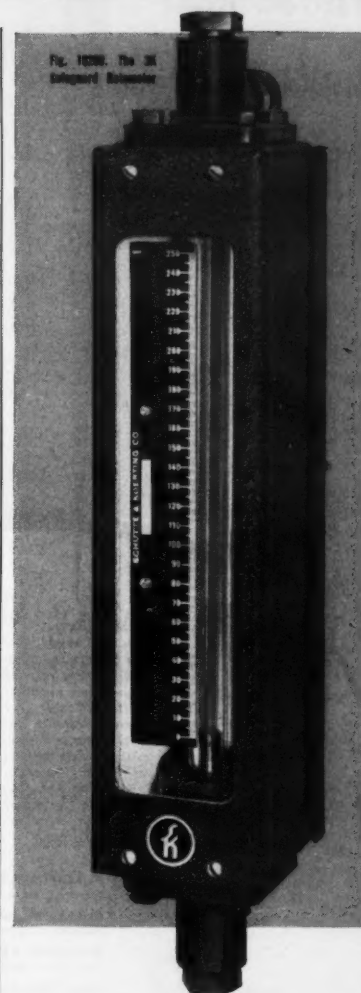


Fig. 10000, The SK Safeguard Rotameter

Glass metering tube has cylindrical inlet and outlet pieces of the same outside diameter—allowing use of the same size packing rings on either end of the tube.

Horizontal inlet and outlet can be connected in four different positions.

Two types of metal mandrel made tubes are available—the "HCF," a High Capacity Fluted tube, or the "R," a conical tapered tube without flutes.

Various rotor designs and materials permit wide capacity range within one meter.

End fittings are available in cast iron, bronze, and stainless steel.

Neoprene packing gives corrosion resistance, tight seal, long service life. Other packing material is available.

Rotor removal and tube cleaning without dismantling easily done through non-leaking coated clean-out plug.



When inquiring check CP 5241 on handy form, pgs. 2-3

These new Arnold O. Beckman bulletins describe...

WHERE OXYGEN CONTROL

is vital in a wide range of manufacturing and processing operations—chemicals, metals, soaps, oils, drugs, plastics, ceramics, petroleum products and many others.

WHY OXYGEN MEASUREMENT

is the key to more efficient operation, higher quality, better uniformity, less waste and greater overall profits.

HOW OXYGEN ANALYZERS

by Arnold O. Beckman, Inc. permit greater accuracy, adaptability, and efficiency than other types because these instruments continuously measure process streams by a unique magnetic principle that provides direct physical measurement of oxygen itself—not of some secondary relationship.

SEND TODAY FOR THIS HELPFUL DATA...

BULLETIN 103:

Describes the Model G-2 Beckman Oxygen Analyzer—the instrument to use where maximum accuracy is essential. Model G-2 ranges are available for oxygen concentrations as low as 0-1000 parts per million—as high as 95-100%—or virtually any other range or combination of ranges. Bulletin 103 describes the unique magnetic operating principle used in Model G-2 Analyzers, equipment, accessories and typical applications.



BULLETIN 108:

Describes the Model F-3 Beckman Oxygen Analyzer—the instrument designed primarily for industrial applications such as combustion control, catalyst regeneration, sulfur grinding, etc., which require an oxygen measuring range of 0-5%, 0-10%, 0-15% or higher. Bulletin 108 describes the unique magnetic operating principle used in Model F-3 Analyzers, gives equipment specifications and typical applications for this instrument.

BULLETIN AD607: Contains helpful charts and data on most efficient methods of controlling various combustion processes.

BULLETIN AD610: Contains helpful data on Chemical Applications, illustrates a typical installation, lists equipment required.

BULLETIN AD611: Contains helpful data on Tunnel Kiln Applications, shows typical installation, details equipment required.

BULLETIN AD613: Contains helpful data on measuring O₂ content of High Purity Gases, shows typical sampling system, lists equipment required.

Arnold O. Beckman INC.

1020 Mission St., South Pasadena 10, California

Please send Bulletins checked below:

☐ 103 ☐ 108 ☐ 607 ☐ 610 ☐ 611 ☐ 613

Name _____

Company and Address _____

Position _____

CHECK THESE IMPORTANT ADVANTAGES OF ARNOLD O. BECKMAN OXYGEN ANALYZERS

DIRECT MEASUREMENT: Operating principle is based on unique paramagnetic properties of Oxygen. Arnold O. Beckman Oxygen Analyzers measure oxygen by direct physical means. No chemicals are required, no saturated atmospheres, no "hot wires" or other complex devices that may alter the composition of the sample gas.

HIGH ACCURACY: Readings are accurate within $\pm 1\%$ of full scale for spans of 2% O₂ and greater (e.g. .02% O₂ on 0-2% O₂ range). Accuracy is unaffected by ambient temperature variations.

LINEAR SCALE: Calibration of Arnold O. Beckman Oxygen Analyzers is strictly linear and the scale is accurate over the entire range.

SIMPLE SAMPLING: Only a small volume is necessary—50-250 cc. per minute. Accuracy is not affected by variations in flow rate. Samples may be dry or saturated. Nothing is added to the sample, and it may be returned to the process unchanged. Many corrosive or reactive gases can be analyzed.

COMPLETELY AUTOMATIC: Sampling and measurement are continuous and automatic. No attendant is necessary.

RUGGED CONSTRUCTION: The unit is shock mounted to protect it from extreme vibration and shock. Maintenance is negligible—no chemicals, filaments, wicks, etc., to replenish—no orifices or glassware to clean and replace.

MANY RANGES: From a few parts per million to 100% O₂. Multi-range instruments are also available.

Your inquiries on oxygen measuring and control problems are welcomed. Please write directly to our head office giving data on the requirements of your particular application.

INSTRUMENTATION

Thousands of components for electronics

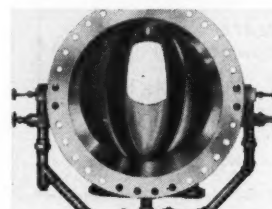
Special emphasis has been placed on equipment for industrial maintenance, research, and production requirements in this catalog. Detailed listings are provided for standard and special-purpose tubes, test instruments, voltage stabilizers, transformers, and many other electronic components.

Featured in the catalog is a moderately priced television camera operated by remote control. It has been designed for uses in industry.

Cat 135 is issued by Allied Radio Corp., Dept. CP, 100 N. Western Ave., Chicago 80, Ill. Specify CP 5243, pages 2 and 3.

Elliptical throat of Venturi scours itself clean . . .

provides continuing accuracy for slow streams of sludge or sediment-bearing liquid



Elliptical throat can be seen in end view

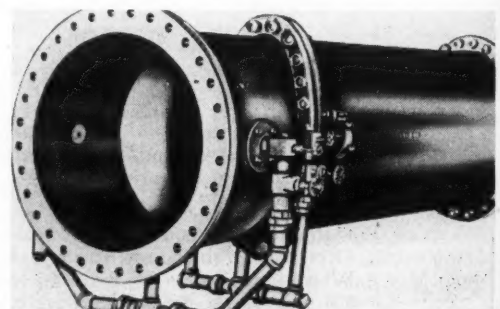
Uses: Designed specifically for accurate measurement of low-velocity sewage, sludge and waste products under low-pressure conditions.

Features: Elliptical shape was chosen for Venturi so that both top and bottom of Venturi section could be flat.

This prevents sludge from accumulating at bottom, or air from building up at top.

Description: Venturi sections range from 12 to 84 inches in diameter and have elliptical throats. Major axis of the elliptical throat is on a vertical plane. Since this major diameter is the same as diameter of pipe to which it is coupled, both top and bottom are straight and flat.

Design makes it possible to build tubes, in some cases, of formed steel plate rather than completely of cast iron. Despite their semi-special nature



¾ view shows construction of Venturi section

The above informative literature will gladly be sent you free. For maximum convenience, use the coupon at right.

When inquiring check CP 5242 on handy form, pgs. 2-3

INSTRUMENTATION

Venturies are designed for connection with circular inlets and outlets and can be connected with standard cast iron pipe sections.

(Type VE Elliptical Venturis are manufactured by Simplex Valve & Meter Co., Dept. CP, 68th & Upland Sts., Philadelphia 42, Pa. . . . or for more information on manufacturer's product reader may simply check CP 5244 on handy form located between pages two and three.)

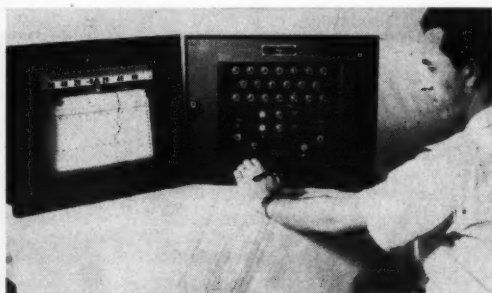
Scans twenty points for 3 variables . . .

system can also be adapted for checking sixty points

Uses: Can scan 20 for each of three variables. System can also be adapted to record as many as 60 variables.

Features: Any physical quantity which can be made to provide an electrical output can be monitored by this system.

Description: Unit can be set to various combinations of manual or automatic operation. It can be used to record from 1 to 3 variables and can be adapted to record as many as 60 variables. Time necessary to sample and record all 60 measurements is approximately 2 minutes. Values being measured



Operator can select sequence of points recorded

are printed on recorder, at the same time symbols are automatically printed to identify a variable being measured and point of measurement.

Switching unit can be set to record 3 variables at one point and then automatically switch to next position. It can be also set to record in sequence any one of the variables at each of the 20 positions. It will, of course, continuously monitor 3 variables at one position if desired. Instrument is also capable of giving complete time history of any one point's single variable.

Equipment is currently in use with pick-up probes designed for measurement of skin temperature, air temperature, and air velocity.

(Scanning system is designed and built by Hastings Instrument Co., Inc., Dept. CP, Superhighway and Pine Ave., Hampton, Virginia . . . or for more information check CP 5245 on handy form, pages 2 and 3.)

BENDIX ULTRA-VISCOSON



**measures, records and controls viscosity
instantly, continuously, automatically!**

This unique electronic instrument—the Bendix Ultra-Viscoson—provides *instant, continuous and automatic* viscosity measurement of hundreds of fluid materials in any stage of processing. All you do to get an accurate viscosity check is look at the dial. And all you do to install it is insert the small, rugged probe—by means of threaded connections—in a pipeline, kettle, pressure vessel, fractionating tower or tank.

In addition to indicating viscosity, the Bendix Ultra-Viscoson can be connected directly to any standard recorder or recorder-controller to automatically record and control viscosity in continuous processes.

You'll realize substantial savings, too, with a Bendix Ultra-Viscoson on the job. It completely eliminates costly work stoppage, sample taking, lengthy laboratory analyses and human error. Find out how you can improve your operation with a Bendix Ultra-Viscoson. Write today for complete information.

Simple . . . Flexible . . . Reliable!

No moving parts • Hermetically sealed probe • Operates in temperatures up to 650°F. and pressures of 1000 p.s.i. (special units available for higher pressures) • Measures in milliseconds • Remote operation • Permanently installed probe • Easily combined with remote recorder and automatic controls • Multi-probe and automatic temperature compensating systems available

FOR FULL
PARTICULARS
WRITE TO

CINCINNATI DIVISION OF

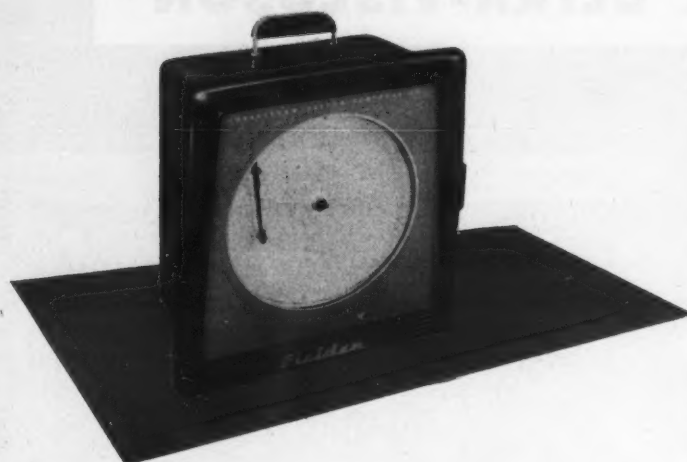
203 W. 3rd Street, Cincinnati 2, Ohio

Export Sales: Bendix International Division, 205 East 42nd St., New York 17, N. Y.



When inquiring check CP 5246 on handy form, pgs. 2-3

accurate instrumentation
need not be costly



here's proof . . . Accurate to $\pm 1\%$ of full scale, this Fielden TEKTOLOG Electronic Recorder has a sensitivity of $\pm 0.1\%$ and reproducibility of $\pm 0.5\%$. Yet it sells at a price substantially below that of servo-operated potentiometer-type recorders!

Reason: *Simplified* design, circuitry and construction. TEKTOLOG's recorder mechanism consists of only 4 principal units. By stressing *simplicity*, Fielden can bring you *all the accuracy you need* for most applications—without extra charges for marginal precision.

If simplified, practical instrumentation appeals to you, write us today for full details. There's no obligation.

DOLLAR FOR DOLLAR—YOUR BEST INSTRUMENT VALUE

Fielden

INSTRUMENT DIVISION

ROBERTSHAW-FULTON CONTROLS COMPANY
2920 N. 4th St., Dept. G, Philadelphia 33, Pa.

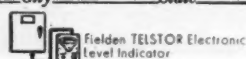
Send full details of Fielden simplified ☐ TEKTOLOG Electronic Recorders
☐ TELSTOR Electronic Level Indicator ☐ TEKTO Electronic Level Control

Name _____

Title _____

Company _____

Address _____ City _____ State _____



When inquiring check CP 5247 on handy form, pgs. 2-3

INSTRUMENTATION

Sampling gage shows sludge in tank



Uses: Test gage shows depth of sludge in bottom of storage tank. It also brings a sample of the sludge for inspection or analysis.

Features: Gage is specially designed for petroleum products — no parts are affected by contact with hydrocarbons.

Description: Gage is made with measuring rule and transparent container. Trip valve is located in base of container. This valve closes when bottom of tank is contacted, thus sample of bottom contents are trapped. These may be raised and examined. Gage, of course, is used on foot of ordinary tank measuring stick.

Measurement tape in tube is printed on all white plastic and coated with clear plastic to prevent discoloration or fading.

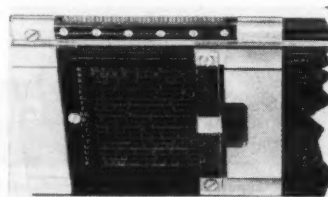
Visa-Test Gage is a product of Visa-Test Sales Co., Dept. CP, 1515 Alturas Drive, Burlingame, Calif. . . . or for more information check CP 5248 on handy form, pages 2 and 3.)

Graphic multiplying, dividing, etc., speeded . . .

new instrument has a wide variety of uses

Uses: Newly developed instrument can be used for proportioning, direct reading of dimensions from scale drawings or photographs, and graphic operations of multiplying, dividing, enlarging proportionately, etc.

Features: Unique operating principle allows sliderule-like in-



Portion of left end of instrument with spring compressed

FOR GAUGING LIQUIDS OF ALL KINDS
100% AUTOMATIC
APPROVED BY UNDERWRITERS' LABORATORIES

LIQUIDOMETER

"LIQUIDS WORTH STORING ARE WORTH MEASURING" WITH A LIQUIDOMETER Tank Gauge

WRITE FOR COMPLETE DETAILS

THE LIQUIDOMETER CORP.
38-18 SKILLMAN AVE., LONG ISLAND CITY, N.Y.

When inquiring check CP 5249 on handy form, pgs. 2-3

Protect

Expensive GAGES

Sprague Shut Off Valves automatically cut out gages and other pressure-sensitive instruments when fluid pressures go beyond their operating limits. Automatically open when pressure is again within approx. 80% of set cut-out points. Available for any pressure setting between 10 PSI and 5000 PSI.

Save valuable man hours. Eliminate opening and closing manually operated shut off valves. Supplied with standard pipe thread connections, also available with AN tube fittings. Body is 1½" aluminum hexagon stock. Length 5½". Bronze or stainless steel bodies also available. Easy to install. Thousands in use. Write for bulletin.

SPRAGUE
Engineering and Sales Corp.
1144 WEST 135TH ST., GARDENA, CALIF.

When inquiring check CP 5250 on handy form, pgs. 2-3

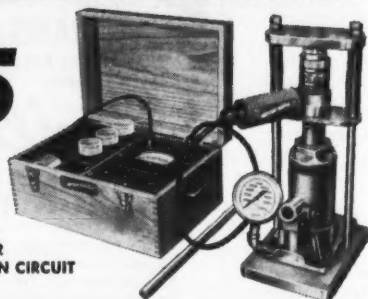
CHEMICAL PROCESSING

A 1 MINUTE MOISTURE CHECK

INSURES QUALITY OF PRODUCT
WHEN YOU USE THE
NEW MOISTURE REGISTER

G5

EXCLUSIVE
R. F. POWER
ABSORPTION CIRCUIT



PROVED IN THE FIELD ON

SUGARS

STARCHES

FLOURS

CITRUS PULPS

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DRIED EGGS

FEEDS

POWDERED CHEMICALS

YEASTS

BAKING MIXES

MEALS

FERTILIZERS

Send Coupon TODAY!

**ELECTRONIC
MOISTURE REGISTER**

Moisture Register
testing equipment
is the standard in moisture
testing for all industries.

1510 W. Chestnut St., Alhambra, California, Dept. CP

Please send me complete information on MODEL G5

MOISTURE REGISTER. I want to test _____ (MATERIAL)

NAME _____ TITLE _____

COMPANY _____ ADDRESS _____

CITY _____ STATE _____

When inquiring check CP 5251 on handy form, pgs. 2-3

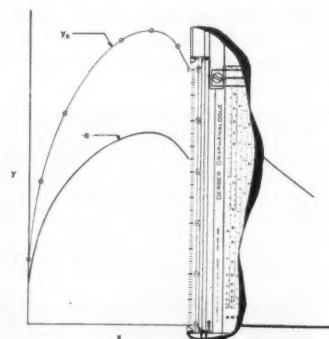
DECEMBER, 1953

INSTRUMENTATION

strument to perform a host of complex graphical and mathematical operations with extreme simplicity.

Description: Instrument handles linear functions as well as arbitrary nonlinear functions directly. It is about 14 inches long, 5 inches wide, and 1/2 inch thick. Heart of the device is an accurate triangular spring fixed at the left end, and attached at its right end to the slide. A second spring attached similarly carries marking discs with scale numbers.

Triangular spring has 103 coils of which 100 coils are calibrated. As slide is moved, triangular



Curves may be ratioed, normalized, reduced, etc. in a single operation

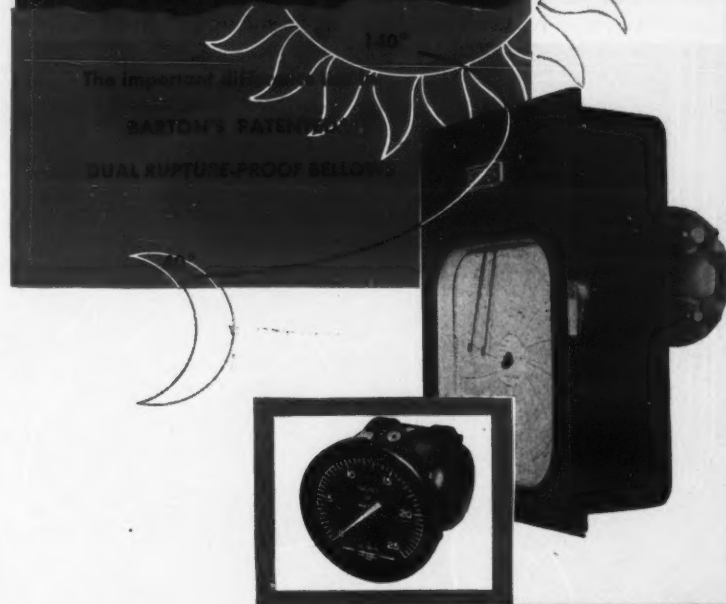
spring stretches or compresses linearly. Marking discs follow it to provide a linear scale of any length. Both springs are protected by a transparent cover.

Main body of the instrument is aluminum. Ends as well as protective strip under the instrument are also aluminum and are fastened to base. Slide, self-locking in any position, has hair-line indicator which is used in reading scales.

Sixteen scales are included on instrument face. Typical examples are: reciprocal inch, foot, centimeter, trigonometric functions, degrees, squares & roots, logs, and probability.

(GraphAnalogue is a recent development of the Gerber Scientific Instrument Co., Dept. CP, 89 Spruce Street, Hartford 1, Conn. . . or for more information reader may simply check CP 5252 on handy Reader Service slip located between pages 2 and 3.)

test data proves...
BARTON FLOWMETERS MOST ACCURATE



Scientifically controlled tests, impartially conducted, to determine the comparative accuracy of several flowmeters of popular designs have conclusively proved the superior advantages of Barton's Dual-Bellows meter body. The Barton was the only flowmeter that averaged less than 1% deviation from perfect calibration over a 100°F change in meter temperature; others tested deviated as much as 3%. The ingeniously engineered Barton Meter Body insures a higher order of accuracy when the instrument is subjected to normal day and night temperature variations.

Sustained accuracy is one outstanding Barton flowmeter advantage. In addition, the actuating element is compact, rupture-proof, yet highly sensitive, insuring a long life with high responsiveness. Problems associated with mercury, pressure bearings and over-ranging are eliminated.

Externally adjustable pulsation dampner eliminates pen flutter and chart painting. Torque tube drive assures absence of leakage and friction. Barton flowmeters are completely self-draining, or venting... need no sealpots. Install cost-cutting Barton flowmeters.

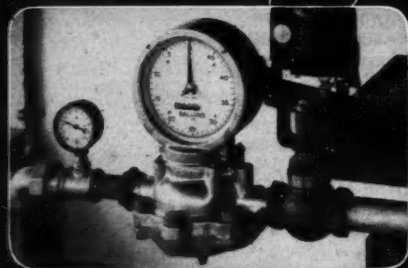
...request Barton Bulletin 11C-4.

*Pat. Nos. 2400048, 2500360, 2590324, other patents pending.

BARTON INSTRUMENT CORPORATION
INDUSTRIAL INSTRUMENTS
1437 SOUTH EASTERN AVENUE, LOS ANGELES 22, CALIFORNIA

When inquiring check CP 5253 on handy form, pgs. 2-3

"I save time and get better accuracy in our liquid measurements with NIAGARA Electriccontact METERS"



Commercial liquids CAN be measured quickly, simply and positively. NIAGARA Electriccontact METERS assure accurate measurements through automatic control. The meter actuates a solenoid valve to stop the flow of liquid after delivery of the preset quantity. There's no friction load on the meter. NIAGARA METERS replace obsolete tanks and gauge sticks with a sure method of precise measurement.

Find out just how NIAGARA Electriccontact METERS can give you the most accurate batch measurements—automatically.

Send in the Data Request blank below... today.

BUFFALO METER CO.

2892 MAIN STREET
BUFFALO, N. Y.

Gentlemen:

Please send me complete information on the use of economical NIAGARA METERS, based on the data below:

Liquid..... Pressure..... p.s.i.
Temp..... ° F.
Flow rate..... g.p.m.
Maximum batch..... gals.
Name.....
Company.....
Address.....

When inquiring check CP 5254 on handy form, pgs. 2-3

INSTRUMENTATION

Turbidity records useful in paper and chemical processes . . .

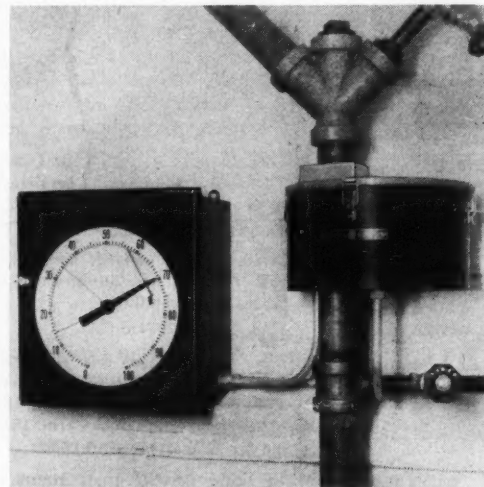
recorder clocks liquid streams with photo-electric eye

Uses: Instrument monitors liquid streams and makes permanent record of turbidity. It may be used with audible or visible alarms.

Specific applications include chemical and paper plants where turbid water supply would affect product quality, monitoring waste, gaging amount of flocculation chemicals to be added to incoming water streams in water treatment plants, detection of oil contamination in boiler feed water, and in checking efficiency of filtration.

Features: Instrument may be adjusted for ranges from 0-25 to 0-10,000 ppm (silica scale).

Description: In theory, liquid carrying no suspended particles transmits all light which enters it — does not scatter light at all. As turbidity increases, scattered light also increases. Instrument's



Recorder (left) is driven by signal generated within sampling head (right) by photo-electric set-up

detecting element is a single photo cell whose current output is proportional to amount of light falling on it. Measurement is made by allowing first scattered light, then transmitted light to fall on the cell. In operation this is done by balancing "scattered light voltage" against a battery. Later this "remembered" battery voltage is balanced against transmitted light voltage. Range-setting iris sets photocell illumination in transmitted light beam equal to its illumination from scattered light. System has been found to be stable with respect to photocell sensitivity, temperature, lamp brightness, line voltage, or color of liquid.

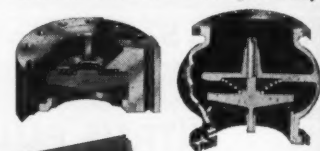
Two main components of instrument are sampling head and recorder. Sampling head contains chamber through which liquid passes, single light source, and photocell. Light source is controlled by shutters so that it alternately shines through

Get the Facts!
about **WATER HAMMER**
and how you can
ELIMINATE THIS
COSTLY NUISANCE
with

**WILLIAMS-HAGER
FLANGED**

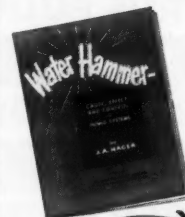
Silent CHECK VALVES

Yes—you can put an end to costly, dangerous water hammer in your piping system—NOW—with Williams-Hager Flanged Silent Check Valves. Compact and durable, they can be installed without special tools—in any position. Built for years of silent service, they are available in standard pipe sizes from 1" to 20". Investigate today!



WRITE FOR
BULLETIN WH-851

This bulletin contains all the facts about water hammer—its cause, effect and control. Write for your copy!



CHECK VALVES

THE WILLIAMS GAUGE CO., INC.

3015 Pennsylvania Ave., Pittsburgh 33, Pa.

MAIL THIS COUPON TODAY

THE WILLIAMS GAUGE CO., INC.

3015 Pennsylvania Avenue
Pittsburgh 33, Pa.

Please send a copy of Bulletin WH-851 on "Water Hammer, Cause, Effect and Control in Piping Systems."

NAME.....
TITLE.....
COMPANY.....
ADDRESS.....
CITY.....
ZONE..... STATE.....

When inquiring check CP 5255 on handy form, pgs. 2-3

CHEMICAL PROCESSING

sample chamber directly on photocell and then at right angle to photocell. Thus comparison measurement is made without changing either lamp or photocell.

Circular chart recorder is standard. It may be remotely located from sampling head. Recorder contains memory circuit and measures ratio of scattered to transmitted light electrically. This ratio is indicated on scale and permanently marked on chart.

Maximum operating pressure of 100 psi is possible. Accuracy of the instrument is $\pm 5\%$, precision, $\pm 3\%$. Unit requires 115 volt AC and completes measuring cycle each sixty seconds.

(Recording Turbidimeter has been developed by General Electric Company, Department CP, 1 River Road, Schenectady 5, New York . . . or for more information reader may simply check CP 5256 on handy Reader Service slip located between pages 2 and 3.)

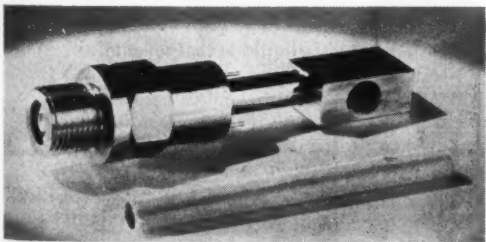
Water cooling allows operation at temps to 5000°F . . .

pressure transducer is small, disposes of heat at 11 Btu per second per square inch

Uses: Transducer for dynamic pressures can be used at temperatures in excess of 5000°F, even in oxidizing atmospheres.

Features: Small unit is water-jacketed so that it can dissipate 11 Btu per second per each square inch of exposed area with a cooling water temperature rise of 85°F.

Description: Water-cooled pressure transducer is 4 inches long, has a maximum diameter of 1 inch, and couples to a $\frac{3}{4}$ inch connection with 16 threads per inch. Catenary diaphragm and cylindrical restraint element are similar to those used in



Four-inch length comparison with ordinary cigarette

manufacturer's other instruments. All exposed parts of transducer are made of stainless steel — this accounts for instrument's ability to operate in highly oxidizing atmospheres.

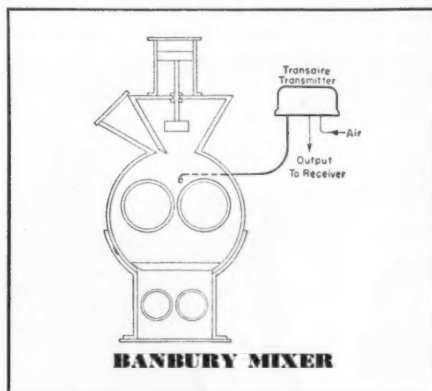
(High-temperature pressure pick-up is available in limited quantities from Control Engineering Corp., Dept. CP, 560 Providence Highway, Norwood, Mass. . . . or for more information reader may simply check CP 5257 on handy form, pages 2 and 3.)

To measure *dynamic* temperatures you need **DYNAMIC ACCURACY!**

DYNAMIC ACCURACY, (the accuracy of an instrument in measuring changing or *dynamic* conditions), reaches a new high in the Taylor TRANSAIRE* Temperature Transmitter. This extreme sensitivity to *changing* conditions is due to the low heat capacity of the cigarette-size bulb and dynamic compensation, i.e., compensation for inherent lags in the measuring sys-

tem and the rate of heat transfer of the process medium. It is achieved by derivative action (SPEED-ACT) in the measuring circuit. Operates on the force-balance principle. No special calibration of receivers is necessary, thanks to standard output pressure range of 3-15 psi. Write for Bulletin 98097, Taylor Instrument Companies, Rochester, N. Y., or Toronto, Canada.

HERE ARE THREE TOUGH MEASUREMENT PROBLEMS SOLVED BY DYNAMIC ACCURACY

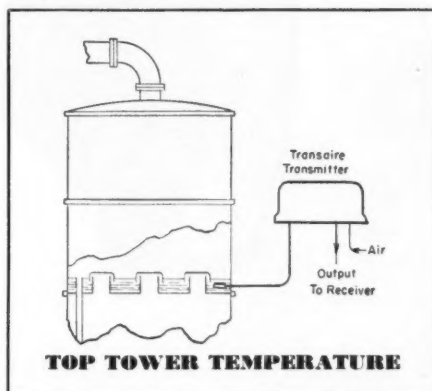


Compensates for Poor Heat Transfer of Mix

Problem: Poor heat transfer of the rubber compounds in a Banbury Mixer makes it difficult to closely measure the mechanical heat generated. Excessive heat causes deterioration of ingredients—and a very real fire hazard.

Solution: TRANSAIRE Temperature Transmitter, with derivative action (SPEED-ACT) in the measuring system, compensates for both the poor heat conductivity of the mix and the inherent thermal lag of the rugged separable well required. The cigarette-size bulb permits its ideal location, and aids the speed of response, as of course does the THERMOSPEED sleeve in the separable well.

Results: An accurate record of the true *dynamic* temperatures of the mix and the *time* of every batch. Another dividend: the process can now be put under automatic control — never before feasible.

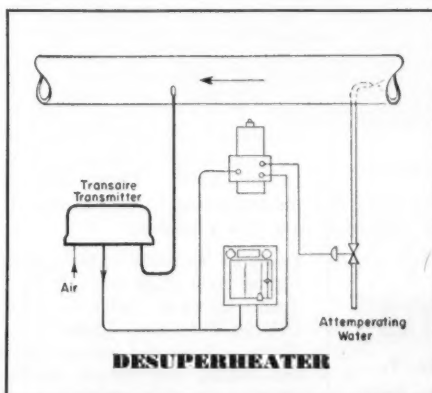


Short Range Span Detects Temperature Trends

Problem: To get highest possible purity of product consistent with good production economy. This requires the quick detection of temperature trends over a very narrow range.

Solution: The short, shiftable range spans (as short as 50°F.) for the TRANSAIRE Temperature Transmitter permit selection of operating range by a simple screwdriver adjustment. SPEED-ACT feature assures detection of temperature change of less than 1/10 of 1% of span and is accurate to $\frac{1}{2}\%$ of span.

Results: Close control because the minute temperature trends are practically instantaneously detected and transmitted to the controller and receiver. This means higher yield of a purer product, also great flexibility in changing to different product requirements.



Fast Speed of Response Catches Rapid Temperature Changes

Problem: Steam at high temperature, as with any gas temperature measuring problem, has poor heat transfer characteristics, making it difficult to measure dynamic temperatures.

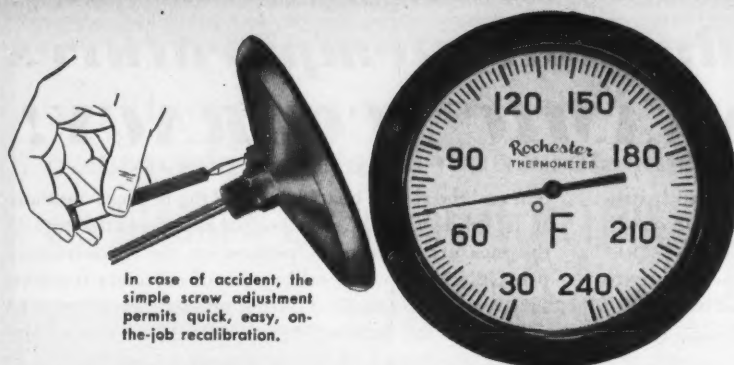
Solution: The low heat capacity of the cigarette-size bulb (made possible by the force-balance system), and SPEED-ACT compensation for the rugged well required, give unprecedented speed of response to temperature changes under these adverse conditions.

Results: Smooth efficient operation, and greater protection to expensive equipment in subsequent processing steps.

*Reg. U.S. Pat. Off.

TAYLOR INSTRUMENTS MEAN ACCURACY FIRST

When inquiring check CP 5258 on handy form, pgs. 2-3



In case of accident, the simple screw adjustment permits quick, easy, on-the-job recalibration.

DON'T DROP IT! BUT IF YOU DO...

ROCHESTER DIAL THERMOMETERS are built to take severe blows without damage to their sensitive movements. But when hit hard enough to knock them out of adjustment, all you need is a screwdriver to put them right back on the job—as accurate as ever. This unique Rochester recalibration feature eliminates the danger of costly production errors due to inaccurate readings.

WELDED STAINLESS STEEL construction makes Rochester thermometers more durable, sensitive, pressure tight and resistant to corrosion than any before offered. Backed by 35 years of instrument making experience.

ORDER TODAY from your Rochester Representative, or write for further details. Rochester Manufacturing Co., Inc., 86 Rockwood Street, Rochester 10, N. Y.

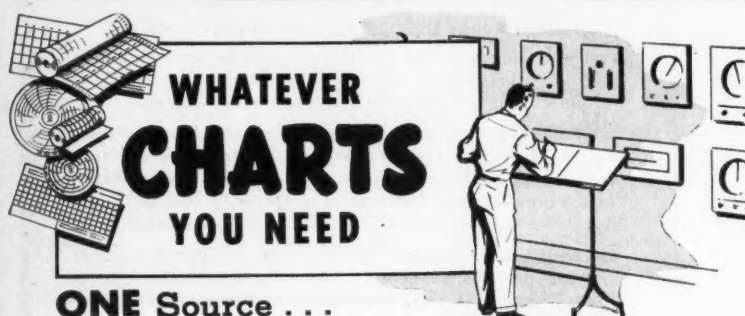
Rochester

Manufacturing Company, Inc.
86 Rockwood St., Rochester 10, N. Y.



DIAL THERMOMETERS GAUGES AMMETERS

When inquiring check CP 5259 on handy form, pgs. 2-3



**WHATEVER
CHARTS
YOU NEED**

ONE Source...

ONE Order... ONE Delivery

TECHNICAL produces over 8,000 different roll and dial charts... you can get all your chart needs from one source.

TECHNICAL keeps in the lead with modern facilities... you get dependable chart accuracy.

TECHNICAL Charts are used by leading concerns... among them: United States Steel, DuPont De Nemours, General Motors, Standard Oil of California.

TECHNICAL'S output has redoubled in only the last four years... more proof of customer satisfaction.

Send for Catalog

TECHNICAL CHARTS INCORPORATED

188 VAN RENSSLAER ST.

BUFFALO 10, N. Y.

Nationally Represented by **TECHNICAL SALES CORPORATION**, 16599 Meyers Road
Detroit 35, Michigan

When inquiring check CP 5260 on handy form, pgs. 2-3

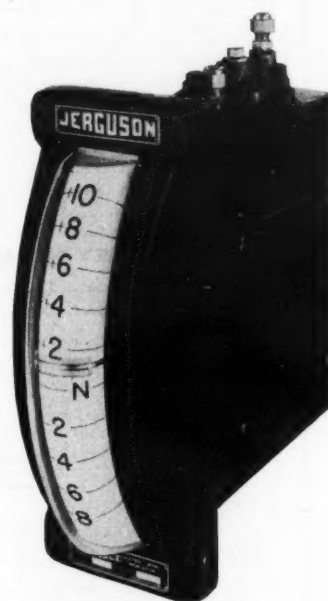
INSTRUMENTATION

Revised level gage can be read from side

Uses: For remote reading of liquid level from any angle.

Features: Convex scale permits a 180° visibility — gage is easily read from anywhere in control room from which gage can be seen.

Description: Convex scale of level gage is designed so that readings of liquid level can be taken from front, or either side, without distortion. Scale markings are on convex face. Indi-



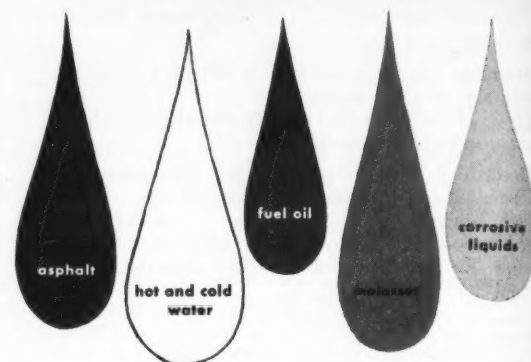
Scale is convex

cator goes around the convex surface. Scales provide for instant reading of liquid levels in boilers, tanks, or other vessels. Accuracy as high as 1/2 of 1% of scale reading are obtained.

Models are available for any pressure and range. No stuffing boxes are used. Light and horn alarm signals, as well as repeaters, are also available.

(Convex Truscale remote reading liquid level gage is built by Jerguson Gage & Valve Co., Dept. CP, 80 Fellsway, Somerville 45, Mass. . . or for more information reader may simply check CP 5261 on handy Reader Service slip, pages 2 and 3.)

viscosities unlimited



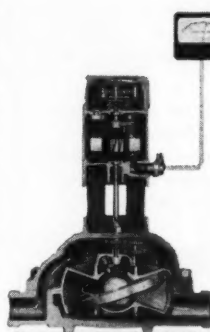
**HAYS VERIFLOW METER
AND HAYS ELECTRONIC VERITROL**
indicate and control liquid flow

Now virtually all fluids can be precisely measured and accurately controlled—from a remote position.

Hays VERIFLOW meter accurately measures, indicates, and totals the flow of corrosive and hard-to-meter liquids without using weigh tanks, orifice plates, or gage sticks.

With the Hays VERITROL you simply set a knob at the rate of flow desired... then, the VERITROL controls the flow of liquid at that set-rate.

Send for Pub. No. 53-766-38.



for corrosive liquids

Acetic Acid, Aluminum Potassium Sulphate, Ammonia, Calcium Compounds, Carbolic Acid, Formaldehyde, Fruit and Vegetable Juices, Hydrogen Peroxide, Phosphoric Acid, Potassium Hydroxide, Sodium Compounds, Sulphuric Acid (concentrated), Stearic Acid, and many others.

Automatic Combustion Control
Boiler Panels • Hays-Penn Flowmeters
Veriflow Meters and Veritrol
Gas Analyzers • Draft Gages
Combustion Test Sets • CO₂ Records
Electronic Oxygen Recorders
Electronic Flowmeters
Electronic Feed Water Controls
Miniature Remote Indicators

hays
CORPORATION

MICHIGAN CITY 34 INDIANA

When inquiring check CP 5262 on handy form, pgs. 2-3

CHEMICAL PROCESSING

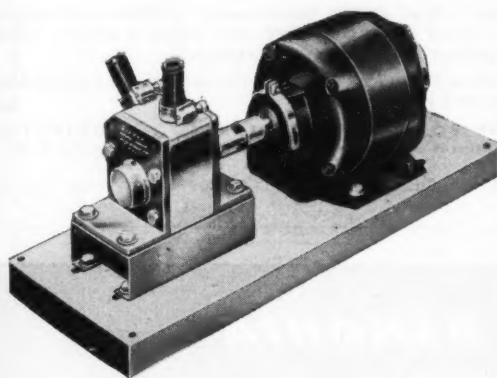
**Specially designed,
pump samples
gases . . .**

wide variety of materials includes polyethylene, Neoprene, silicones, others

Uses: Pump is specially designed for sampling gas streams and process control. Where larger quantities or high pressures are required, use of a reservoir with the pump enables capacities to 35,000 cc per minute (this is approximately 1.25 cubic feet per minute) and pressures from zero to 35 psi with suction lifts up to 22" of mercury.

Features: Gas never contacts metal — design of the pump eliminates stuffing boxes and shaft seals.

Description: Gas sampling pump utilizes eccentric shaft and rotor assembly. These rotate inside and actuate durable precision molded flexible liner. Liners are available in gum rubber, natural rubber,



Pump is shown on base plate with driving motor

Buna N, Hycar, Neoprene, vinyl, silicone, and Compar. Gas trapped by outer surface of liner and inner surface of body block is progressively "squeezed" through pump. Flanges of the liner are pressed into body side in order to seal fluid passage from contact with moving parts.

Since body also contacts fluid, pumps are available with body block in a variety of corrosion-resistant materials to match characteristics of the liner. Bodies can be supplied in polyethylene, Bakelite, and temperature resistant Buna N hard rubber.

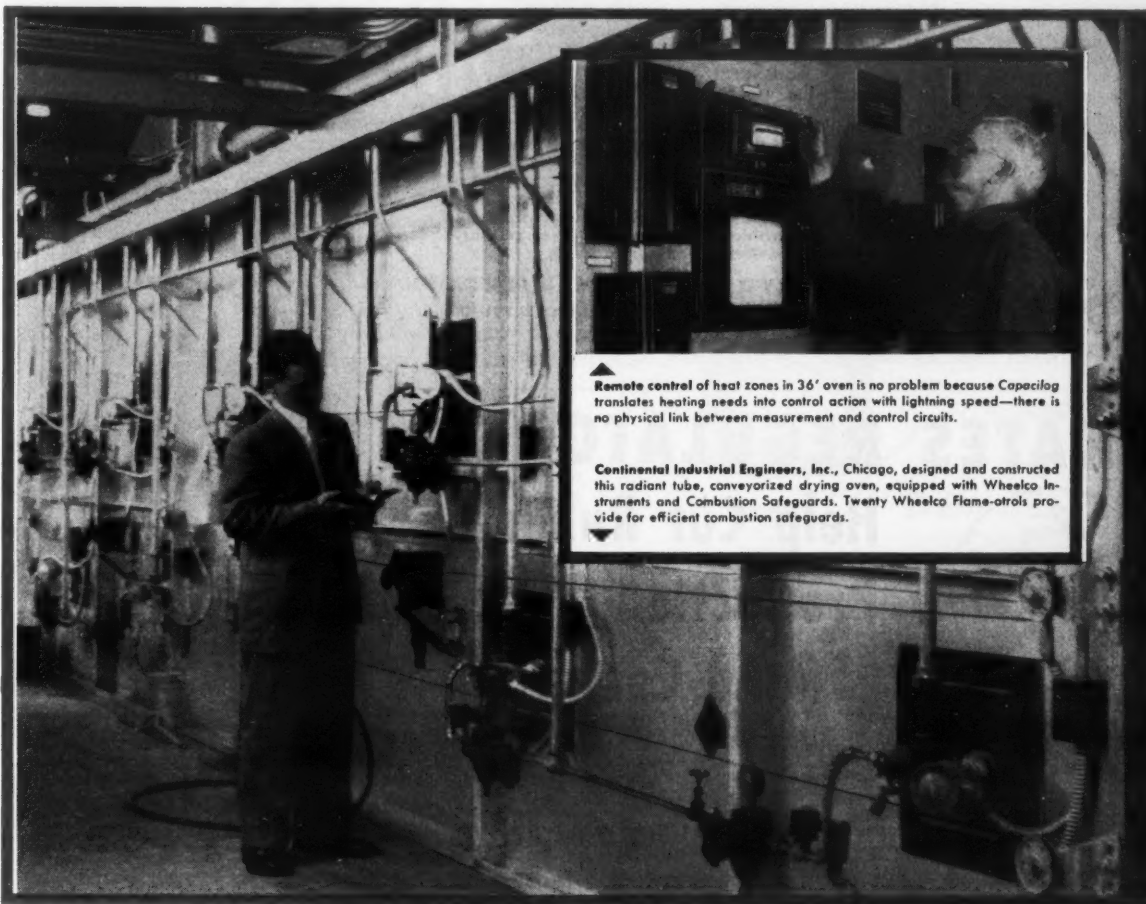
Reservoirs are recommended where continuous operation is required and where relative high vacuums and discharge pressures are specified. Reservoir is placed directly above discharge in discharge line. Reservoir can be filled with water, silicone oil, or any other fluid which will not affect gas sample. Pumps are self-priming and do not contain check valves, gaskets, or shaft seals of any sort.

(Gas Sampling Pump is a product of Vanton Pump & Equipment Corp., Dept. CP, Empire State Building, New York 1, N. Y. . . or for more information check CP 5263 on handy Reader Service slip located between pages 2 and 3.)



Wheelco Instruments

**Safe, simple, straight-line control
of asbestos drying process
at PHILIP CAREY MFG. CO.**



Remote control of heat zones in 36' oven is no problem because Capacilog translates heating needs into control action with lightning speed—there is no physical link between measurement and control circuits.

Continental Industrial Engineers, Inc., Chicago, designed and constructed this radiant tube, conveyorized drying oven, equipped with Wheelco Instruments, and Combustion Safeguards. Twenty Wheelco Flame-arols provide for efficient combustion safeguards.

Write for Bulletins F2-3, C2-1 and THR-1

*Factory-trained field engineers
in all principal cities*

BARBER-COLMAN COMPANY, ROCKFORD, ILLINOIS

Industrial Instruments • Automatic Controls • Air Distribution Products
Aircraft Controls • Small Motors • OVERdoors and Operators • Molded
Products • Metal Cutting Tools • Machine Tools • Textile Machinery

WHEELCO INSTRUMENTS DIVISION
BARBER-COLMAN COMPANY, DEPT. L, 1520 ROCK ST., ROCKFORD, ILLINOIS

Gentlemen: I'm interested in learning more about Wheelco:

☐ Indicating Pyrometers ☐ Controllers ☐ Recorders
☐ Combustion Safeguards ☐ Thermocouples and Accessories

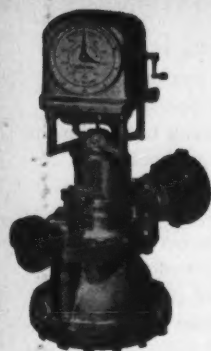
Name _____

Firm Name _____

Address _____

City _____ State _____

When inquiring check CP 5264 on handy form, pgs. 2-3



for all liquid-handling problems

• In any processing operation where the maintenance of a uniform temperature in the process pipes is necessary, a Hetherington & Berner jacketed system will assure dependable, economical production. This is equally true regardless of whether the material being handled requires a hot or cold temperature, what heating or cooling medium is used, or whether the material is corrosive or non-corrosive. Write for

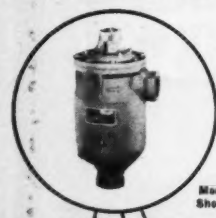
Bulletin J-50. If you have a liquid batching problem, involving either light or heavy liquids, jacketed or un-jacketed construction, investigate the *Fluidometer System*. This system gives accurate, dependable and *completely automatic* batching and is adaptable to practically any liquid measuring problem, whether it involves gallons, barrels or tank cars. Write for Bulletin FI-49.



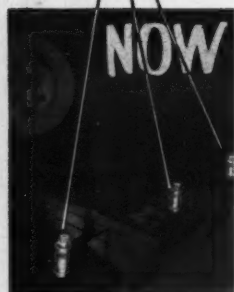
HETHERINGTON & BERNER INC.
711 KENTUCKY AVE. INDIANAPOLIS 7, IND.

When inquiring check CP 5265 on handy form, pgs. 2-3

KATES REGULATORS Help Cut Rubber Production Time and Costs!



Model 3-GA
Shown Here



This B. F. Goodrich Chemical Company pilot plant view shows how liquids flow from the 3 tanks, through 3 Kates Regulators, to a centrifugal pump.

... A completely new process for making high quality cold rubber utilizes Kates Liquid Flow Regulators to "keep watch" over the flow of major ingredients.

By making cold rubber in stainless steel pipes rather than in the costly pressure vessels employed in present production, this new method—being developed by the B. F. Goodrich Chemical Company—turns out cold rubber in just a fraction of the time normally required, and does it at lower cost.

B. F. Goodrich Chemical Company engineers entrusted the job of controlling the flow of soap solution, styrene, and butadiene to a series of Kates Regulators, on the basis of accuracy, dependability and economy.

With Kates Regulators volume of flow is maintained at the set rate despite pressure variations, because the Kates principle of operation actually harnesses pressure changes and uses them to adjust flow instantly. The regulators are virtually trouble-free in operation, and eliminate any time lag or "hunting" for the proper setting. Once the dial is set, you can count on a Kates unit to deliver the right amount of liquid... constantly.

For complete details write for Catalog 521.

the W. A.
Kates co.

430 WAUKESGA RD. • DEERFIELD, ILLINOIS
Representatives in Principal Cities

When inquiring check CP 5266 on handy form, pgs. 2-3

INSTRUMENTATION

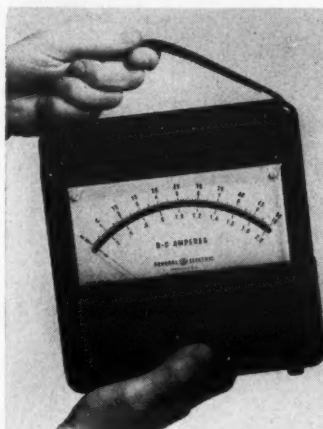
1/2 and 1/4 % accuracy
featured in meters...

electrical instruments read
volts, watts, amps, milliamps

Uses: Two lines of electrical meters read usual electrical quantities of voltage, wattage, amperage, milliamperage, or micro-ampere.

Features: One line (DP-11) has an accuracy of 1/2 of 1% full-scale; other has 1/4 % accuracy.

Description: Both series of DC instruments are suggested for maintenance. More accurate series can be used in fine instrument



Magnetically shielded

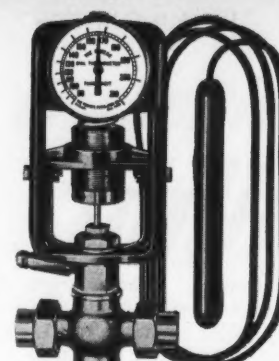
maintenance or in laboratory measurements. Heavily ribbed plastic cases have rounded corners. Spring mounted jeweled bearings are also rugged.

Concentric magnet construction and magnetic shielding make instrument immune to stray flux. Instruments can also be used side-by-side without error.

Meters for all ranges and quantities measure 7 3/4 x 7 7/8 x 3 3/4 inches. They weigh 5 pounds.

(DP-11 and DP-12 instruments are products of General Electric Co., Dept. CP, 1 River Road, Schenectady 5, N. Y. . . or for more information check CP 5267 on handy form, pages 2 and 3.)

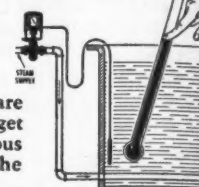
Processing and Engineering Data
starts on page 192



NEW
POWERS
REGULATOR

For
Plating • Anodizing
Bonderizing • Pickling
Cleaning • Rinsing

Holds temperature
where you want it.



Saves LABOR and Steam
Helps Eliminate Costly Rejects

Powers No. 11-MF Regulators are self-operating. They will help you get the most effective use from various solutions by holding them at the right temperature automatically.

Plastic Covered Thermal Bulb and Tubing—is highly resistant to solutions in above processes. Prevents electrical shorts. No insulators required for the regulator.

Easy to Read 4" Dial Thermometer—indicates temperature of liquid being controlled and makes it easy to adjust regulator for different temperatures.

Bulletin 330 describes this simple, dependable control. May we send you a copy? (b31)

THE POWERS REGULATOR CO., SKOKIE, ILL.
Offices in over 50 Cities, see your Phone Book • Established in 1891

When inquiring check CP 5268 on handy form, pgs. 2-3

ASKANIA
UNIT
REGULATOR

A compact package for automatic control

The Askania Unit Regulator is a hydraulic controller for pressure, flow, ratio, and other variables. For precise control of low-level signals, for the economy and simplicity of hydraulic operation, for fast control action, check the Askania Unit Regulator.

It is self-contained—oil pump and reservoir are housed in the regulator body. Ideal for isolated jobs, or for installation at point of measurement or control. Remote panel-mounted control point setting available.

Ask for Bulletin 155.

ASKANIA REGULATOR COMPANY
242 E. Ontario Street Chicago 10, Illinois
Subsidiary of General Precision Equipment Corp.

When inquiring check CP 5269 on handy form, pgs. 2-3

CHEMICAL PROCESSING

Everything but foreman's name reported by printing system

Variety of instrument printing systems have been developed to reduce instrumentation cost, space requirements, to replace conventional logging operations, and to handle data which are appearing too rapidly to be noted otherwise. Records are prepared in a variety of permanent forms which can be referred to later or used for computation.

In general, systems provide for converting signal inputs of pressure or voltage to a digital form and actuating variety of printing or tape recording equipment from the digital signal. Typical outputs are handled by electric typewriters which can type up logs containing 32 points of temperature, pressure, and other variables.

Alternate electric typewriter output is produced in tape form with variable identification, reading, date, and time.

T1	800	JUNE 10	10:30
T2	641	JUNE 10	10:30
T3	1410	JUNE 10	10:30
T4	1500	JUNE 10	10:30
T5	600	JUNE 10	10:30
T6	440	JUNE 10	10:30
T7	480	JUNE 10	10:30
T8	410	JUNE 10	10:30
T9	660	JUNE 10	10:30
T10	1710	JUNE 10	10:30
L1	04	JUNE 10	10:30
L2	10	JUNE 10	10:30
	09	JUNE 10	10:30
P2		JUNE 10	10:30
P3	87	JUNE 10	10:30
P4	70	JUNE 10	10:30
P5	118	JUNE 10	10:30
P6	510	JUNE 10	10:30
P7	201	JUNE 10	10:30
P8	790	JUNE 10	10:30
P9	523	JUNE 10	10:30
P10	807	JUNE 10	10:30
B1	21000	JUNE 10	10:30
B2	40000	JUNE 10	10:30
T1	801	JUNE 10	11:00
T2	645	JUNE 10	11:00
T3	1380	JUNE 10	11:00
T4	1498	JUNE 10	11:00
T5	603	JUNE 10	11:00

Facsimile of tape output of electric typewriter. Columns from left to right are: variable, reading, date, time

and time listed on each line. Where remote location is necessary, teletype systems have been evolved where information is first punched on standard teletype tape, then transmitted.

Interesting special development is termed "printal-arm." Instrument of this type produces a log showing variable, condition responsible for alarm, date, and time. Only abnormal conditions are reported on this type of log.

(Instrument printing systems are engineered and manufactured by Electrical Development Co., Inc., Dept. CP, 40 E. 40th St., New York 16, N. Y. . . . or check CP 5270, pgs. 2 and 3.)

Amazingly simple way to MEASURE DEW POINT



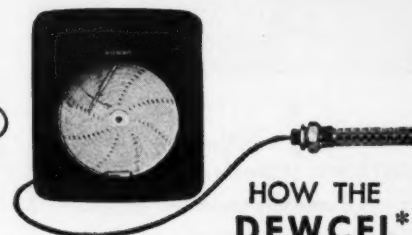
directly . . . accurately . . . continuously

Now you can measure or control the humidity of air or process gases with simplicity and accuracy never before obtainable!

An entirely new-type humidity-sensitive element, the exclusive Foxboro Dewcel*, opens many new possibilities for product improvement in industry. Coupled with a Foxboro Recorder or Controller, the Dewcel offers these outstanding advantages:

1. Direct recording in dew point temperature, at existing pressure.
2. Wide working range — even operates at sub-zero temperatures.
3. Neither adds nor removes water from atmosphere.
4. No water box or circulation of air required.
5. Simplicity that eliminates maintenance.
6. High sustained accuracy.
7. Initial and operating economy.

Investigate Foxboro Dew Point Control for your process. In successful use in nuclear fission, pharmaceutical, food and chemical plants, distilleries, photo film production, drying and storage operations. Write for Bulletin 407. The Foxboro Company, 966 Neponset Ave., Foxboro, Mass., U.S.A.



HOW THE DEWCEL* WORKS

The Dewcel element is a thermometer bulb (liquid-filled or electric-resistance type) jacketed with lithium-chloride-impregnated woven glass tape. Over this are wound two spaced gold or silver wires connected to an AC source. The lithium chloride absorbs moisture, allowing current to flow, generating heat, and raising the temperature. Equilibrium temperature is reached when vapor-pressure of the moist salt exactly balances that of the surrounding air or gas. The System translates this temperature into direct readings of dew point.

Thus, Foxboro Dew Point Instruments give direct readings or control of dew point from —50°F. to 142°F. at working temperatures from —40°F. to 220°F. Readings easily converted to absolute or relative humidity.

*Trade Mark

FOXBORO

REG. U. S. PAT. OFF.

RECORDING · CONTROLLING · INDICATING INSTRUMENTS

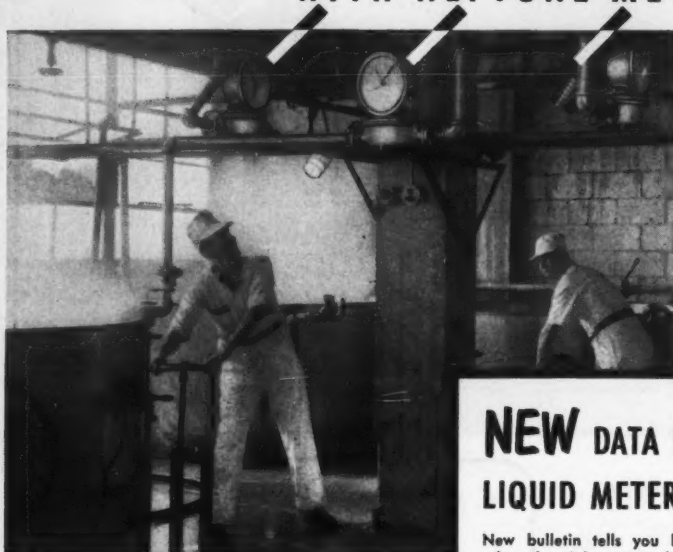
FACTORIES IN THE UNITED STATES CANADA, AND ENGLAND

When inquiring check CP 5271 on handy form, pgs. 2-3

CATSUP FOR A BILLION HAMBURGERS

Quality Controlled

WITH NEPTUNE METERS



The G. S. Suppiger Company makes 30,000,000 bottles of Brooks catsup a year—catsup with a carefully controlled "tangy" flavor—not sweet—not biting—but "just right." Accurate measurement of liquid sugar and other liquid ingredients is vital—accurate measurement delivered to batch after batch by the fine-instrument precision of the three Neptune Meters shown above.

In plant after plant Neptune Meters are the key to quality control. They pay for themselves by eliminating spoilage, spillage, and the unsanitary muss and fuss of gauge sticks, pails or batch tanks. Use them for accurate cost accounting and inventory control, too. Positive displacement type, simple in design, quality built for sustained accuracy. Many types available for handling over a hundred different industrial liquids.

NEPTUNE METER COMPANY
50 WEST 50th STREET • NEW YORK 20, N. Y.

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When inquiring check CP 5272 on handy form, pgs. 2-3

INSTRUMENTATION

Unpolished glass sample tested for refractive index . . .

fast method uses liquid film to "smooth" rough surfaces

Improved refractometer makes rapid and precise measurement of index of refraction of glass samples. Index can be determined with high accuracy in a matter of minutes. Costly and time-consuming grinding and polishing operations are eliminated.

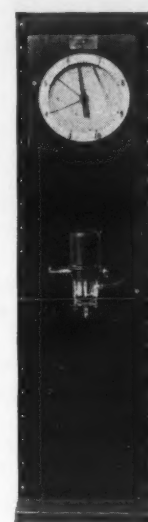
Instrument consists of light source, horizontal filament, collimator, diaphragm, pair of 45°-90° cemented prisms, micrometer, and telescope. Prisms are cemented together to form a 90° "trough" facing upwards. All components are centrally aligned along common horizontal axis.

To determine index of refraction of a piece of glass, sample is cut with a 90° edge, but left unground or polished. It is fitted into the 90° hollow of the cemented prism assembly. An immersion liquid having approximate refractive index of the sample is used as contact liquid between sample and prism.

Observer sees two images at the telescope. Lower half of the optical system produces a direct image of the filament, while upper half gives an image which has passed through glass sample and been refracted. Either image can be blocked out by use of diaphragm. Separation of the upper image from the lower image is a measure of the index of refraction of the sample. Magnitude can be determined by the micrometer. Calibration of the micrometer in terms of index of refraction is a simple matter.

Range of the instrument is changed by substituting different prism assemblies. In each case, glass of the prism assembly corresponds roughly in index of refraction to the sample being measured. Contact liquids match index of refraction of the sample to 0.002. With these and homogeneous, accurately cut samples, an accuracy of ± 0.00002 can be obtained. Certified immersion liquids are commercially available.

(Information courtesy of National Bureau of Standards, United States Department of Commerce, Washington 25, D. C.)



Single-Point
pH Recorder
(Strip Chart Assemblies also available)

CAMBRIDGE pH INDICATORS and RECORDERS

Labor saving — profit producing!

In addition to portable pH Meters, Cambridge makes line-operated Direct Reading pH Indicators and Recorders for permanent installation. They are accurate, stable and assure continuous and trouble-free performance. Either the Recorder, Indicator or both, may be located at any reasonable distance from one or several sampling points. The Glass Electrodes are placed in vapor-tight housings of clog-free sampling chambers.

Send for Bulletin No. 910 T

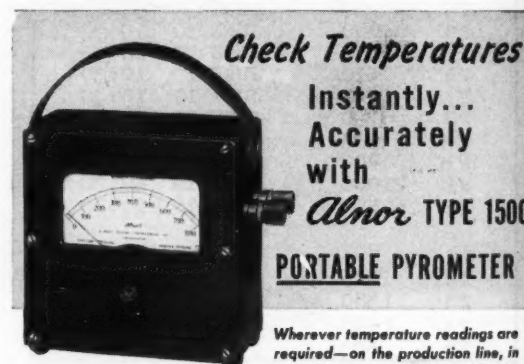
CAMBRIDGE pH EQUIPMENT

CAMBRIDGE INSTRUMENT CO., INC.

3706 Grand Central Terminal, New York 17

**PIONEER MANUFACTURERS
OF PRECISION INSTRUMENTS**

When inquiring check CP 5273 on handy form, pgs. 2-3



**Check Temperatures
Instantly...
Accurately
with
Alnor TYPE 1500
PORTABLE PYROMETER**

Wherever temperature readings are required—on the production line, in the laboratory or in the field—this sturdy precision instrument can bring you instant, accurate results.

Here's Why

It's Fast . . . in operation and quickly read. Precision movement designed to laboratory standards. Direct reading scale face is easily understood—no slide wires or conversion tables necessary.

It's Accurate . . . consistently to within $\frac{1}{4}$ of one percent under almost all variable conditions. Sturdy, protective case assures continued accuracy in toughest portable service. Ten scale ranges available, from 0-400° to 0-3000°F. Equivalent Centigrade scales available at no extra cost.

It's Portable . . . compact size, $6\frac{1}{2}'' \times 6'' \times 3''$, and light weight make this pyrometer highly portable and easy to use anywhere. Write today for complete details and prices. Illinois Testing Laboratories, Inc., Room 504, 420 N. La Salle Street, Chicago 10, Illinois.

Send for Bulletin on 1500 Pyrometer.

Alnor

**PRECISION INSTRUMENTS
FOR EVERY INDUSTRY**

When inquiring check CP 5274 on handy form, pgs. 2-3

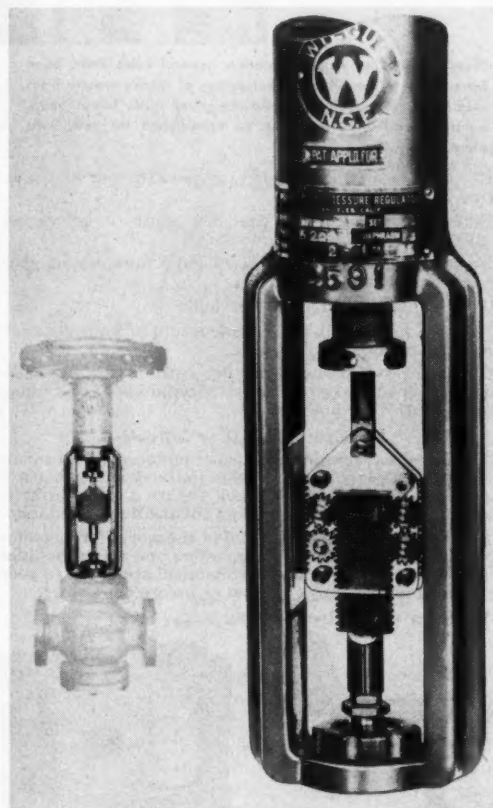
CHEMICAL PROCESSING

Built-in "overdrive" holds valve control closer . . .

and action can be reversed for "low gear" power, if needed

Uses: Valve operator can be supplied in general purpose control valve, or can be used with most standard control valves.

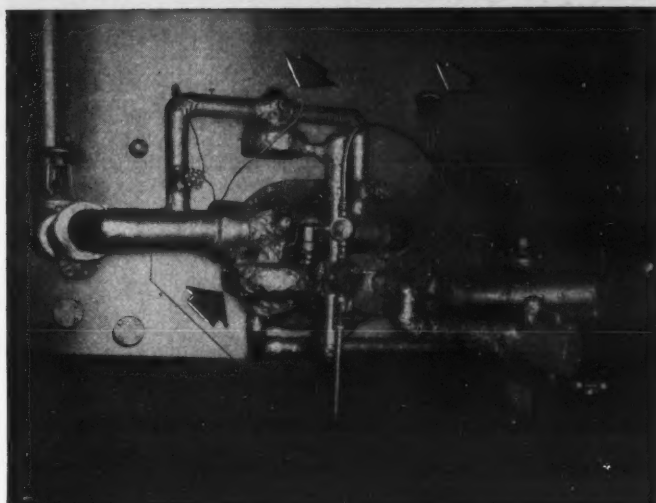
Features: Operator contains gear train which works at a ratio of 2 to 1 providing twice as long a stroke at valve ports as at the diaphragm. With this arrangement greater control sensitivity is attained. Gear train action can be reversed to provide greater power at valve port.



Operator designed for incorporation in most standard control valves

Description: General effect of 2 to 1 gear train is to double response speed of the valve and cut flow or pressure variation in half. When gear train is reversed, power at the valve is doubled. Single port of valves for example, can maintain positive shut-off at high pressures.

(Magna-Stroke is a development of Natural Gas Equipment, Inc., Dept. CP, 190 E. Glenarm St., Pasadena 2, Calif. . . or for more information reader may simply check CP 5275 on handy form, pages 2 and 3.)



BULK STORAGE TANKS

● **SUCTION HEATERS**, as widely used to bring heavy fuel oil in bulk storage to pumping temperature, require *fast acting* temperature control. All the controlling must be done while the oil is drawn off through the heater.

The control valve must be of the dead-end, *tight shutoff* type to prevent running away of the temperature when no oil is pumped out.

Sarco self-contained, pilot operated regulator, type 24-30, (Fig. 1) meets these requirements perfectly and will hold delivered fluid temperature constant within close limits.

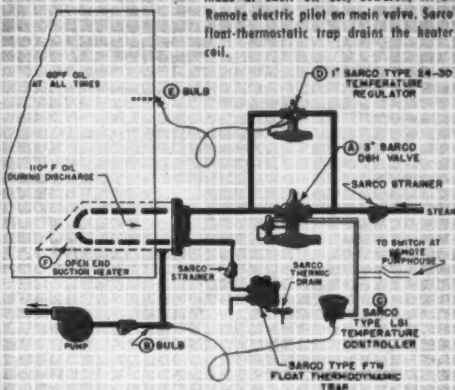
Fig. 2 is a simplified hook-up for low pressure steam, using self-operated regulator, type TR-21

Send for a Questionnaire or write for Catalog 600-14, to Sarco Company, Inc., Empire State Bldg., New York 1, N. Y. Branches in principal cities. Sarco Canada Ltd., Toronto 8, Ont.

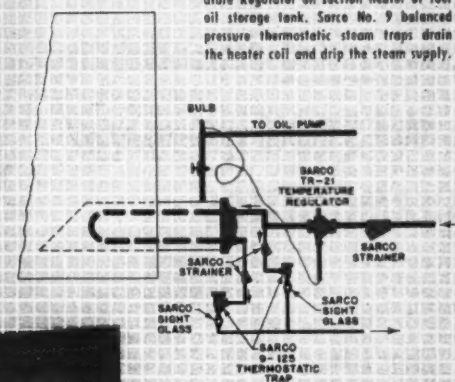
SARCO **saves steam**
improves product quality and output

When inquiring check CP 5276 on handy form, pgs. 2-3

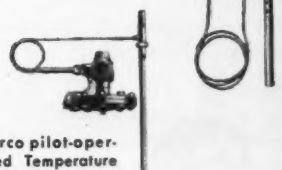
● Fig. 1, Sarco type 24-30 self-contained, pilot-operated Temperature Regulators on bulk storage tanks. One of 13 installations made at Shell Oil Co., Searon, N. J. Remote electric pilot on main valve. Sarco float-thermostatic trap drains the heater coil.



● Fig. 2, Sarco TR-21 self-operated Temperature Regulator on section heater of fuel oil storage tank. Sarco No. 9 balanced pressure thermostatic steam traps drain the heater coil and drip the steam supply.



Sarco self-operated Temperature Regulator, type TR-21, sizes 1/2" to 8", for low pressure steam.

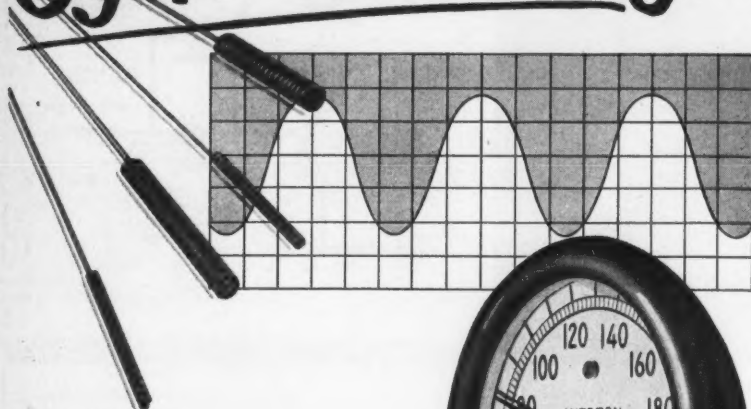


Sarco pilot-operated Temperature Regulator, type 24-30 for dead-end service and high steam pressure.



A Sarco pipeline strainer should be ahead of every regulator to keep out dirt and scale.

Cycle-Seasoning...



**gives added dependability
to WESTON all-metal
THERMOMETERS**

To INSURE accurate functioning over long periods, a bi-metal sensing element must necessarily be aged. But there's a big difference in the aging methods employed! Each element in a WESTON Thermometer is first WESTON made . . . then placed in a chamber and subjected to *broad range cycle seasoning* for prolonged periods. When finally placed in a thermometer it is *fit and ready* to give the precise measurements . . . the long-term dependability . . . so typical of all instruments bearing the WESTON name. WESTON Thermometers are available in all types, sizes, ranges and stem lengths for all industrial applications. Literature available . . . WESTON Electrical Instrument Corporation, 614 Frelinghuysen Avenue, Newark 5, New Jersey.



**Thermometers with
the MULTIPLE HELIX**



**Stocked
by leading
Distributors**

WESTON Thermometers

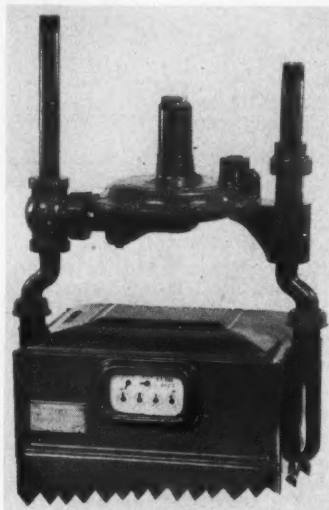
When inquiring check CP 5277 on handy form, pgs. 2-3

INSTRUMENTATION

Meter bar supports regulator . . .

regulating unit designed for use where meter bar is required

Meter bar regulator is a complete unit. Regulator has been designed specifically for use where a meter bar is required. Chief advantages



of the mounting are space saving and avoidance of additional cost for separate bar.

This unit has vertical inlets in four sizes $\frac{1}{2}$, $\frac{3}{4}$, 1, $1\frac{1}{4}$ inch — and can be provided with optional horizontal inlet in the three smaller sizes. Vertical outlets are also available in the three smaller sizes. Union and elbow assembly can also be provided where needed.

(Meter bar regulator "173" is a product of Rockwell Mfg. Co., Dept. CP, 400 N. Lexington Ave., Pittsburgh 8, Pa. . . or for more information check CP 5278 on handy form, pages 2 and 3.)

How to make tests at 5000 volts

Technical bulletin describes high voltage direct current testing instrument. Model features a range to 5000 volts DC and as much as 100 microamperes. Bulletin 14AA is issued by Associated Research, Inc., Dept. CP, 3758 West Belmont Ave., Chicago 18, Ill. When inquiring specify CP 5279, pgs. 2 & 3.

AIR POLLUTION

**How high
should a
smoke stack
be?**



From decades of experimentation general rules have been formulated to establish the behaviour of smoke wastes from chimneys. Meteorological knowledge of time, temperature, humidity and turbulence can be established for your own plant location.

If you have an air pollution problem in your manufacturing process . . .

Before you build or buy that new plant . . . before you modify your present equipment . . .

Better get the latest meteorological facts about your present or future location.

They can save you a lot of money.

Did you know that even the location of your chimney can help control air pollution?

Can you process at night under more favorable conditions? Can you make better use of wind speed and direction to control air pollution?

Foresighted Company Officials

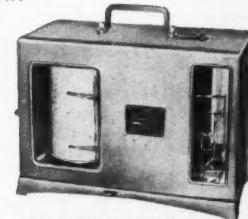
Management, making full use of meteorological conditions above a plant site, can anticipate exactly what will happen to smoke from a stack before a blue print is drawn . . . or a steam shovel digs out the first foundation.

Bendix-Friez . . . the standard of the world for meteorological instruments for 77 years offers you all its facilities to help you find a practical, economical approach to your air pollution problems . . . now or before they start.

Write to the address below.



AEROVANE Indicates and records wind speed and direction. Recognized as "best all-purpose wind measuring instrument yet devised." Readily installed and easily maintained.



HYGRO-THERMOGRAPH The leader in its field. Noted for precise accuracy and long-time dependability. Portable, easy to operate. Widely used in laboratories, factories and offices.



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EXPORT SALES

Bendix International Division
204 E. 42nd St., New York 17, N.Y. U.S.A.

When inquiring check CP 5280 on handy form, pgs. 2-3

CHEMICAL PROCESSING

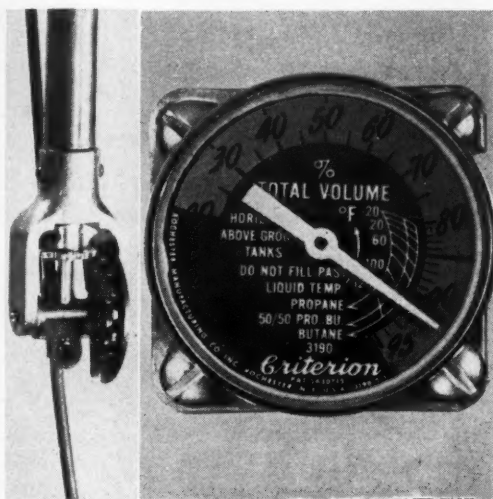
Special features insure accurate gaging of LPG . . .

high vapor-pressure liquid petroleum gas and ammonia use special gage

Uses: Liquid petroleum gases and anhydrous ammonia storage tanks may be gaged for liquid level with this instrument.

Features: Several improvements over previous models have been made. These include: stainless head plates, interchangeable snap-on dial chamber, corrosion-resistant steel floats, and other changes.

Description: Interchangeable dials are positioned by key and groove arrangement and held in place by circular spring which snaps into recess. Removal or replacement is simple, no tools are required.



Left—Improved gear suspension. Right—Interchangeable indicating dial

Another change is the gear segment which rotates with the gear within the tank. Special tooth design is used to provide free rolling contact and close response. Steel float is silver soldered for LPG service and soft soldered for ammonia applications. Baked corrosion-proofing finish is used and "will withstand 600 to 900 psi."

Float rod and counterweight assembly have also been redesigned so that counterweight hugs center-shaft support member to make installation of a compact head easier. Highly tempered float rod is not easily bent.

Headplates of new models employ same bolt circles as previous models, thus easily replace them. They are available for either top or side mounting on LPG storage tanks.

(Series 3190 gages are being produced by Rochester Mfg. Co., Dept. CP, 86 Rochwood St., Rochester 10, N. Y. . . . or for more information reader may simply check CP 5281 on handy form located between pages 2 and 3.)

How would YOU solve these two problems?

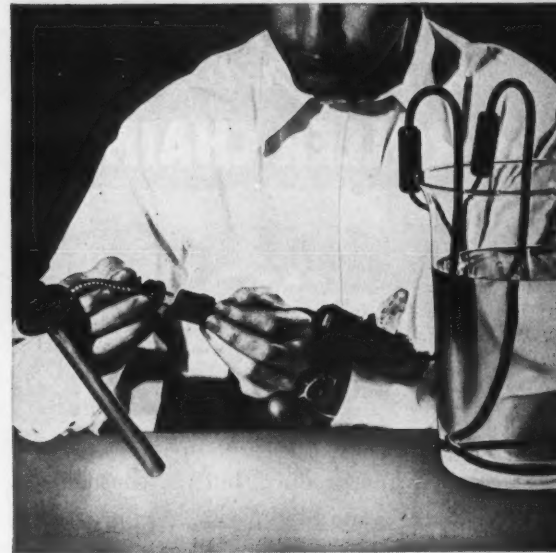


1. FLINTKOTE INSULATED SIDING is saturated with hot asphalt by a continuous conveyor process through a dip tank. Fenwal THERMOSWITCH® Thermostats, connected to pilot lights, warn when asphalt varies from safe operating level. The totally enclosed mechanism of the THERMOSWITCH units is not affected by the high heat (420°F) or viscosity of the liquid.



3. YOU, TOO, MAY BENEFIT from a Fenwal THERMOSWITCH Control.* Compact, highly resistant to shock and vibration, Fenwal THERMOSWITCH units have solved many types of temperature control problems throughout industry. The external, single-metal shell expands or contracts *instantly* to temperature changes, making or breaking electrical contacts.

*Cartridge Type Illustrated



2. LABORATORY WORK SAVED. Let one Fenwal All-Purpose Laboratory THERMOSWITCH thermostat do the work of many. This unit has a quick-disconnect plug — goes readily from job to job. It provides close temperature control for solids, liquids and gases. Stainless steel shell, resistant to corrosion, shock and vibration.



4. SEND FOR THIS NEW CATALOG for complete explanation of the unique THERMOSWITCH unit. Also ask for more detailed, illustrated discussions of the problems above. Fenwal engineers will be glad to help you solve your temperature control problems involving heat, humidity, radiant heat, pressure and other variables. Write **Fenwal Incorporated, 2412 Pleasant St., Ashland, Massachusetts.**



THERMOSWITCH®

Electric Temperature Control and Detection Devices

SENSITIVE . . . but only to heat

When inquiring check CP 5282 on handy form, pgs. 2-3

Why is there a difference in ROLLER CHAINS?



For the past sixty-two years the Diamond Chain Company has continuously devoted its efforts to the attainment of higher quality in the product, and the constant expansion in the use of roller chain as a superior mechanical means of power transfer . . . Research, testing and engineering developments have always been factors of first consideration at Diamond Chain.

FOR EXAMPLE:—

1. Diamond Chain has improved the pin and bushing holes in the link plates by proper pitch hole preparation. Pins and bushings are case hardened.
2. Diamond Chain has long recognized that certain types of internal stressing of chain parts would increase fatigue resistance. To this end, link plates have been specially processed and chain rollers and other parts have been shot-peened since 1944.
3. Diamond Roller Chain is constantly improved. Time tested improvements become standard for production as soon as established and certified.
4. Fully equipped and well staffed chemical and physical testing laboratories have made it possible to control raw material specification, their treatment and processing.
5. Diamond Chain has established production processing methods and quality controls through multiple inspection to insure uniformity of high quality in continuous production runs.
6. As always the Diamond trade-mark on roller chain is the Hall Mark of Quality.

DIAMOND CHAIN COMPANY, Inc.

Dept. 411, 402 Kentucky Avenue, Indianapolis 7, Indiana
Offices and Distributors in All Principal Cities

Refer to the classified section of your local telephone directory under the heading CHAINS or CHAINS-ROLLER

DIAMOND  **ROLLER CHAINS**

2000 BUSHEL/HOUR OF MALT

Stream from Boxcar to Brewery

Remote control of pneumatic operation virtually eliminates manual handling

material handling

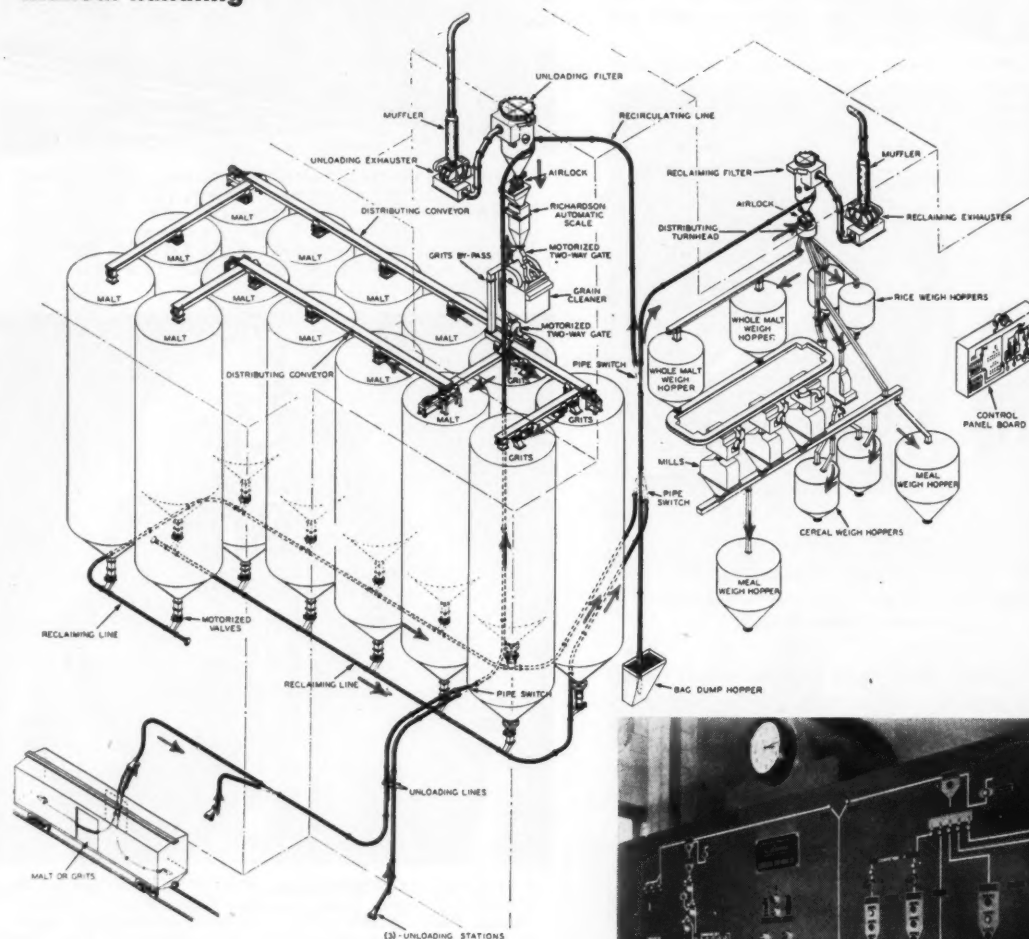
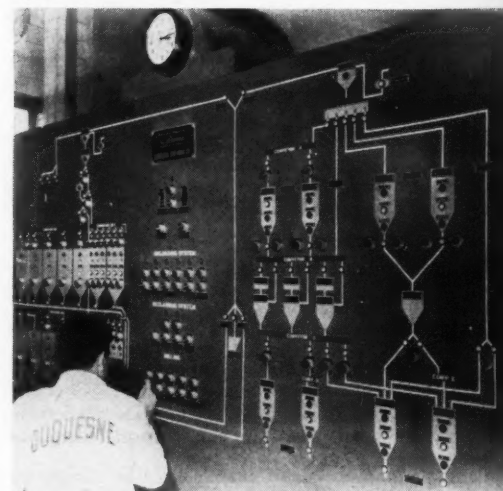


Fig 1 Drawing shows layout of the two Airveyor systems installed in the brewery. One unloads cars of malt, rice or grits into storage; the other delivers material from storage to processing equipment. System has a capacity of 2000 bushels of malt, or 25 tons of rice or grits per hr and can be remotely controlled by operator at control panel board shown



By employing remote-controlled, pneumatic techniques, a large eastern brewery has virtually eliminated all manual handling of raw materials going from boxcars into processing in its 11-story 2,000,000 bbl brewhouse.

Principal components of the installation as used by the Duquesne Brewing Co., Pittsburgh, Pa., are two giant Airveyor systems, one of which unloads cars for delivery into storage bins; the other reclaims from storage and delivers to processing equipment. Capacity of the vacuum type unload-

(Continued on next page)

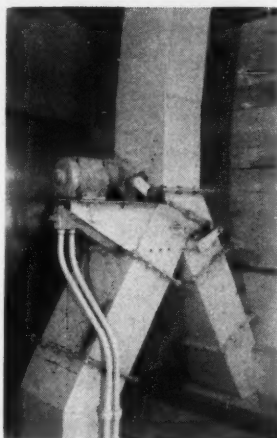
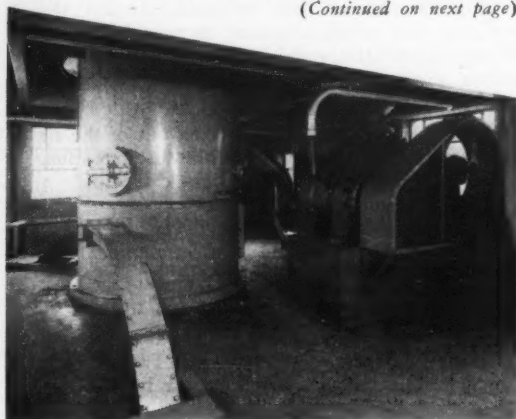
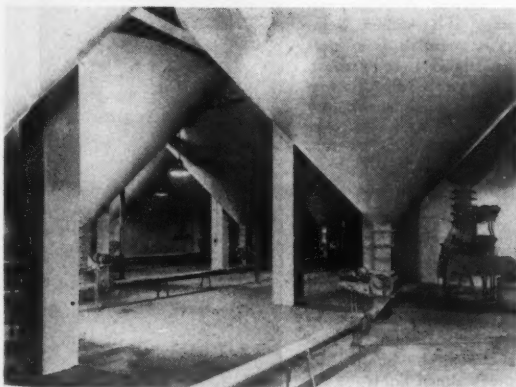


Fig 2 From the boxcars, bulk material is piped to eleventh floor height to receiving filters shown. Positive-pressure type exhauster provides powerful air flow necessary to unload the cars below and send material into filter

Fig 3 Motorized two-way gate can be regulated from remote control board either to send malt into cleaner or by-pass other material

Fig 4 Bottom outlets of storage bins are equipped with remotely-operated discharge valves



6 SPECIFIC BENEFITS

gained from these ELWELL-PARKER Trucks

Here are highlights from the success story of an E-P fleet at a prominent midwestern tannery:—

- 1 Elwell-Parkers have "enabled us to install a completely different and *advanced* method of handling hides . . ."
- 2 "Leather sure gets around in a hurry"—Elwell-Parkers help synchronize the flow of 3 million pounds of stock from one operation to the next in the processing cycle.
- 3 Heavy-duty Elwell-Parkers give dependable service—are "the greatest work horses of our tannery".
- 4 In storing pallets of hides, Elwell-Parkers can "plunk them right up to the ceiling".
- 5 Back injuries and sprains decreased sharply now that hides are no longer "manhandled" on wheelbarrows.
- 6 Trucks prove versatile in many maintenance operations, such as moving heavy machinery.

What make truck could work in the water and grease year in and year out like these Elwell-Parkers?

In every branch of the chemical industry, *bigger* unit loads are being moved *faster* and for *less* by Elwell-Parkers . . . *You, too, can benefit*—the first step is to have an experienced MAN analyze your material handling requirements. No obligation. Write The Elwell-Parker Electric Company, 4019 St. Clair Avenue, Cleveland 3, Ohio.



"INDUSTRIAL LOGISTICS"

Send for this complete handbook on the science of materials handling. Please name your product.

ELWELL-PARKER
POWER INDUSTRIAL TRUCKS

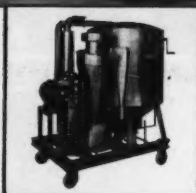
Established 1893

When inquiring check CP 5284 on handy form, pgs. 2-3

Air CUTS BULK CHEMICAL HANDLING COSTS



Unloader Unit
and Pick-up Nozzle



Dust Collector
and Vacuum Pump Unit

VACU-VEYOR is safe, sanitary and dust free.

This completely enclosed, pneumatic system conveys up to 40,000 pounds of dry bulk material per hour. Handles any material in powder, pellet, granular or crystalline form.

Efficient, Low-cost Conveying

- Simple operation requires only one man.
- Eliminates sacking and all intermediate handling.
- Sanitary, direct conveying to skips, bins, vats or hoppers.
- Portable or fixed units for unloading trucks, ships or railroad cars.
- Conveys up to 200 feet horizontally—150 feet vertically.
- Clean, thorough pick-up from corners and inaccessible spaces.
- Prevents dust, eliminates dangers of silicosis.
- Flexible hoses ease around corners or other obstacles.
- Dependable operation with low maintenance costs.

Some of the many types of materials more efficiently conveyed by VACU-VEYOR pneumatic systems include:

Gypsum	Lime	Catalysts	Plastics	Lead Oxide
Bauxite	Soda Ash	Carbon Black	Salt	Cement

VACU-VEYOR pneumatic conveyors can be engineered and built to handle practically any desired capacity, with portable or fixed installations as required.

For further information, write today to Dept. J-1039-3

VACU-BLAST CO. INC.
BELMONT • CALIFORNIA

When inquiring check CP 5285 on handy form, pgs. 2-3

For long-life, low-cost belt conveying...

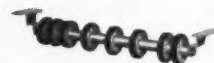


standardize on
LINK-BELT
IDLERS

FOR every step of your processing and handling, you can look to Link-Belt for a complete line of idlers. Each type is highly refined in design to minimize friction loss... assure maximum handling efficiency for the specific assignment.

You'll like their low maintenance, too. Grease-in-dirt-out seals preserve the lubricant. Dozens of other design features promote free-rolling, long-life action.

Choose from a full line of 20° and 45° troughing idlers in a variety of styles. Belt-training and flat belt idlers are also available. Ask your Link-Belt representative or distributor for your copy of new Book 2416.



Series "100" rubber
tread return idler

Series "100" 20°
troughing idler



Series "100" idlers provide
smooth rolling for 300 tons
of salt per hour.

LINK-BELT

ROLLER BEARING IDLERS

LINK-BELT COMPANY: Plants: Chicago, Indianapolis, Philadelphia, Colmar, Pa., Atlanta, Houston, Minneapolis, San Francisco, Los Angeles, Seattle, Toronto, Springs (South Africa), Sydney (Australia). Sales Offices, Factory Branch Stores and Distributors in Principal Cities.

When inquiring check CP 5286 on handy form, pgs. 2-3

MATERIAL HANDLING

(Continued from preceding page)

ing system, which can be operated from any one of three car stations, is 2000 bu of malt or 25 tons of rice or grits per hr. A master control board enables an operator to direct flow of materials (enough to make 2,000,000 bbl of beer annually) from track to storage to processing.

In emptying the boxcars, two flexible metal hoses work from each end of the boxcar simultaneously. Equipped with pick-up nozzles, they connect to stationary pipelines leading to a receiving filter.

A positive-pressure type exhaustor creates the powerful flow of air necessary to propel material through the pipelines and into the filter. A rotary airlock discharges material from the filter into an automatic receiving scale.

The filter, in which solids are taken out of the air stream with a 100 per cent visible dust retention, is of the continuous, fully automatic type.

From the automatic scale, malt is passed into a cleaner, which in turn discharges into the steel storage bins through a train of distributing conveyors. There are a total of 14 huge storage bins: 11 for malt, the others for grits and rice.

Materials other than malt are by-passed around the cleaner on their way to storage. Two-way gate directs material either into cleaner or by-pass.

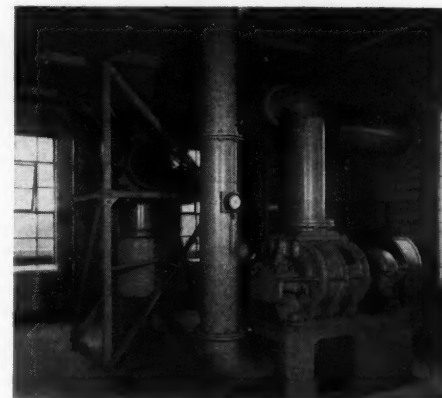


Fig 5 Reclaiming filter, exhaustor and drive motor for second Airveyor system. This system withdraws materials from storage, delivers to process. (Note turnhead at bottom serving multiple spouts)



Fig 6 One of several pipe switches used in the system. This three-way unit selects from any one of its branch pipes and position is indicated on master control board by signal lights

MATERIAL HANDLING

Material flow is directed remotely from the master control board shown above. On this board are mounted all "start" and "stop" buttons as well as a flow diagram, and with indicating lights revealing the routing of the material.

A second Airveyor system withdraws material from the bottom of the storage bins on the third floor and delivers it to a reclaiming filter on the eighth floor, from which it is directed to process by means of mechanical distributors. This system has a capacity of 750 bu of malt or 10 tons of rice or grits an hour. Each storage bin has a motorized withdrawal valve, operated from the master control board.

The reclaiming filter is also of the continuous, fully automatic type, and discharges to any one of five destinations by means of a turnhead. Materials feed by gravity to the malt mills, scale hoppers, cereal cookers, or other equipment.

In addition to car unloading, this particular system also is equipped with a special bag-dump hopper for handling such raw materials as ground cereal or caramel malt. This hopper connects with both the unloading and the reclaiming filter, thus making it possible to send these materials either into storage or directly into process.

The unloading system, which normally delivers to storage, is also arranged for recirculating material from one bin to another.

Several pipe switches such as shown in Fig 6 are used in this installation as a convenient means of selecting any one of several branch pipes. Electrical interlocks rule out human error through automatic sequence starting.

Storage bins are equipped with high material-level indicators which energize corresponding lights on the control board, and which also shut down the system when a bin has become full.

(Conveying systems as used at the brewery are development of the Airveyor Division, Fuller Company, Dept. CP, Catasauqua, Pa. . . . or for more information check CP 5287 on handy form, pages 2 and 3.)

Maximum safety with mobile lift designed for one-man operation

Mobile hand lift truck designed for maximum safety with one-man operation is described in manufacturer's literature. Hydraulic units will lift loads of 1000 lb to a height of 53" easily and quickly, according to manufacturer. Combination "snap-on" plate permits use as platform truck when forks are not required. Units feature foot lever operation, safety release pedal, and wheel lock.

Literature on "one-man" hydraulic lift truck is available from Safeway Industrial Equipment Corp., Dept. CP, 184 N. Franklin St., Chicago 6, Ill. When inquiring specify CP 5288 on handy Reader Service slip located between pages two and three.

Could You Use This Versatile Helper?



LEMAC COMPANY, Los Angeles, Calif.
S-A Natural Vibrating Frequency Conveyor as used for salvaging plastic

S-A Portable
**VIBRATING
CONVEYOR**

shows up defective parts and
salvages usable plastic . . .

REDLER Conveyor-Elevators
ZIPPER Conveyor-Elevators
Vibrating Conveyors

Belt Conveyors

Screw Conveyors

Bucket Elevators

Pan Conveyors & Feeders

Circular Bin Dischargers

Centrifugal Loaders & Pilers

TELLEVEL Bin Level Controls

Ship Loaders & Unloaders

Storage & Reclaiming Systems

Box Car Loaders & Unloaders

Bin Gates, All Types

SEALMASTER Ball Bearing Units

You're likely to find this conveyor unit in any part of the Lemac Company plant. It serves in turn as a feeder, sorting table and salvage collector.

As a sorting table it rests horizontally on the floor. Vibrating at the natural frequency of its coil springs, it turns plastic parts over and over as they are conveyed along. Girl inspectors can quickly spot and remove defectives.

One of the Lemac Company's products is a plastic spray nozzle with a stainless steel ball valve. To salvage the plastic from defective units, they are first crushed to break the ball, causing it to become magnetic. The mixture of

broken plastic and balls is gravity fed to the S-A Conveyor, where magnets hung over the trough remove the broken balls. Unbroken, non-magnetic balls which escape the crusher, roll backwards down the trough to a container at the feed end. With all metal safely removed the plastic can be reused in the injection molding machines.

Wherever there's a handling need . . . for a conveyor or a complete conveying system—to cut costs or simplify operations—S-A engineers are trained and experienced in finding the most economical and practical answer. See if we can't help you. Write for a free survey.

STEPHEN S-ADAMSON

11 Ridgeway Avenue, Aurora, Illinois

MFG. CO.

Los Angeles, Calif., Belleville, Ontario

DESIGNERS AND MANUFACTURERS OF ALL TYPES OF BULK MATERIALS HANDLING EQUIPMENT

When inquiring check CP 5289 on handy form, pgs. 2-3



How To Make More Money

Tuesday, October 21, 1952 THE MIAMI HERALD 21-A
Financial News
Winn & Lovett's Earnings On Rise
By United Press
JACKSONVILLE—Winn & Lovett Grocery Co. reported for the quarter ended Sept. 20 sharply higher earnings, reflecting economies achieved through mechanization in warehousing and merchandise handling.
Net for the first quarter of the current fiscal year totaled \$600,597, or 44 cents a share on common, compared with \$409,342 or 29 cents in the same quarter last year. Net sales of \$41,851,672 compared with \$36,763,499.
As of Sept. 20 the food chain had in operation 181 retail outlets in Florida.

THIS NEWS CLIPPING suggests one way to make more money. Winn & Lovett's "sharply higher earnings" prove that a dollar saved is still a dollar earned.

"Mechanization" saved more than 50% of Winn & Lovett's handling bill. "Mechanization" in this case means a fleet of CLARK fork trucks and towing tractors, operated on a well-planned schedule. These savings, together with increased retail volume and retail operating improvements, resulted in "sharply higher earnings," and the company made financial headlines.

The moral of this story is this:

Call in your local CLARK dealer to discuss ways to cut handling costs. That's what Winn & Lovett did, and look what happened!

CLARK ELECTRIC, GAS, DIESEL, L.P. GAS
AND POWERED HAND TRUCKS - INDUSTRIAL TOWING TRACTORS
INDUSTRIAL TRUCK DIVISION - CLARK EQUIPMENT COMPANY - BATTLE CREEK 9, MICHIGAN
Please send: ☐ Condensed Catalog ☐ Have representative call
☐ Driver Training Movie
Name _____
Firm Name _____
Street _____
City _____ Zone _____ State _____

When inquiring check CP 5290 on handy form, pgs. 2-3

MATERIAL HANDLING

Flashproof hoist feature adapts unit to many applications . . .

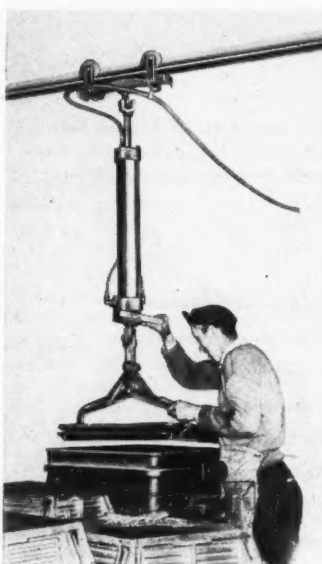
has but one moving part, capacities from 100 to 3500 lb

Uses: Designed for flexibility and safety in all types of materials handling. Since it is spark-proof, it may be used where explosive gases are present; is also safe for handling jar-explosive materials.

Features: Unit is designed with only one moving part, thus minimizing maintenance.

Description: Pneu-Lift air cylinder hoist is available in capacities from 100 to 3500 lb and with lifting strokes ranging from 24 to 49 inches. Unit is of the bleeder-type design for fine adjustment of movement.

Built-in check valve permits air line to be disconnected without disturbing positioning and also



May be used where explosive gases are present

permits hoist and its load to be moved from place to place without necessity of long air lines. Load may be lowered without re-connecting the air line.

(Development of the Air Control Div. of Lehigh Foundries, Inc., Dept. CP, 1500 Lehigh Drive, Easton, Pa. . . or check CP 5291, pages 2 and 3.)

STOP VIBRATION and

- Improve Equipment Layout
- Reduce Machine Installation Costs
- Improve Work Quality
- Reduce Maintenance
- Improve Employee Efficiency

Write for your free copy of Bulletin G-105

Representatives in Principal Cities

THE KORFUND COMPANY, INC.
KORFUND VIBRATION CONTROL
48-13E Thirty Second Place, Long Island City 1, N. Y.
In Canada: 510 Canal Bank, Ville St. Pierre, Montreal

When inquiring check CP 5292 on handy form, pgs. 2-3

Convey Your Bulk Materials By SCREW . . .
VERTICALLY . . . LATERALLY
OR ON AN INCLINE
FAST and CLEAN
TOTALLY ENCLOSED
LESS SPACE REQUIRED
NO MANHANDLING
COSTS LESS TO RUN
READILY ACCESSIBLE
Conveying by Screw is the modern way of handling free-flowing bulk material. It saves time — work and money. The system may be integrated with your entire production procedure . . . taking material from receiving point . . . delivering to storage or to cleaning and processing equipment . . . then from processing to storage or packing.
Conveyor Screws (or Augers) can be made a definite part of your production procedure. Screws can be had to gather material, mix it, (wet, dry or sticky) deliver to dryers — take from dryers, etc., forming a continuous flow — without any manhandling.
Learn about the many types of Screws we manufacture — in alloy materials to suit the process, hot dip galvanized or plain steel. Our many years of application experience are at your disposal. Write today.
SCREW CONVEYOR CORPORATION
699 HOFFMAN ST.
HAMMOND, IND. • WINONA, MISS.

"HAMMOND"
HELICOID AND SECTIONAL FLIGHT
Screw Conveyors

When inquiring check CP 5293 on handy form, pgs. 2-3

CHEMICAL PROCESSING

MATERIAL HANDLING

Built-in adjustment for belt pitch, increased capacity, easy storage highlight aluminum conveyor

Uses: For plant, yard, warehouse handling of materials.

Features: Fast, accurate adjustment to exact belt pitch desired (after head of conveyor has been positioned) is possible with built-in jack-screw. Unit can be handily stored on end when it is not in use.

Description: Load rating of some LS aluminum conveyor models has been increased through use



Belt pitch adjustment is handy

of 1/2 hp electric motor instead of the former 1/3 hp motor. A 3/4 hp motor is also available, giving a wide range of capacities, belt speeds, voltages, etc., with unit.

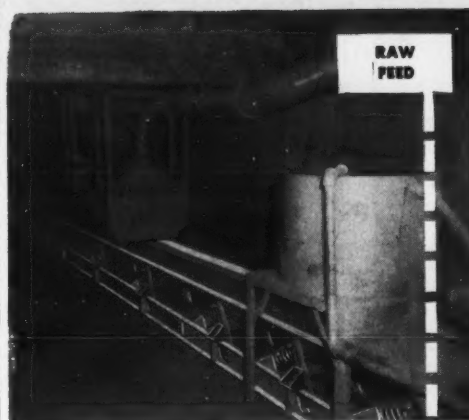
Conveyor unit is in 10 and 16" widths, five lengths from 11 to 21 feet. Each model is balanced on free-rolling running gear so that one man can easily roll it.

(Development of the Rapids-Standard Co., Inc., Dept. CP, 342 Rapistan Building, Grand Rapids 2, Mich. . . . or for more information reader may simply check CP 5294 on handy form located between pages 2 and 3.)

Issues 12-page bulletin on cast elevator buckets

Illustrated 12-page bulletin shows manufacturer's complete line of cast malleable and Promal elevator buckets for handling ores, grain, cement, sugar, etc. Detailed information is provided on mounting of buckets on belts and chains, with tables and diagrams on bucket punching. Various chain attachments and elevator bolts are illustrated. Fifty-five standard size buckets are listed. Tables give dimensions, weights, and capacities.

Bul 2465 is issued by the Link-Belt Company, Dept. CP, 307 N. Michigan Ave., Chicago 1, Ill. When inquiring reader may simply specify CP 5295 on handy form located between pages 2 and 3.

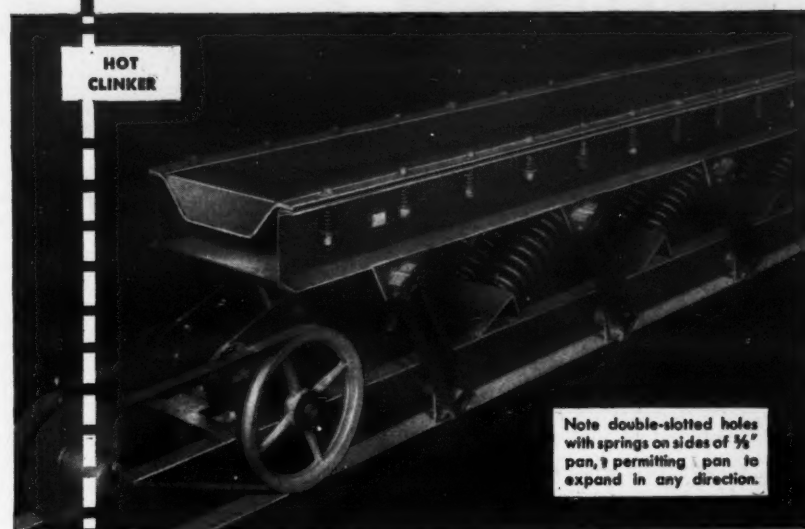


HIGH CAPACITY
Up to 80 tons per hour on 12" models!

HIGH TEMPERATURE
Up to 750° F. on standard models—1600° F. on high-temperature models!

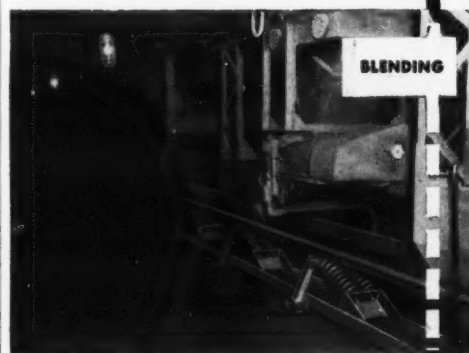
HEAVY-DUTY SERVICE
Pans up to 3/4" plate!

LOW HORSEPOWER ASSURES LOW MAINTENANCE
1000 foot-tons per hour per H.P.!



The toughest job in a cement plant—conveying and cooling hot clinker—comes naturally to the rugged Carrier Natural-Frequency Conveyor shown above. By comparison, the raw-feed and blending operations are just plain duck soup, but Carrier Conveyors do all three jobs with equal ease and economy.

Cement-industry applications represent only a fraction of the many uses for Natural-Frequency Conveyors. These amazing conveyors are now moving scores of other hard-to-handle products—things like mill scale and slag . . . bulk chemicals . . . castings . . . food products . . . sand . . . machine turnings—conveying and processing them with spectacular success. If you handle anything hot, sharp, wet, brittle, abrasive, jagged or oily, it will pay you to get all the facts. Use the coupon, today!



Get the Facts Today!

Carrier Conveyor Corporation—Dept. CP 12-3
Frankfort Avenue at Clifton, Louisville 6, Ky.

Gentlemen: Without obligation, please send complete information on Carrier Natural-Frequency Conveyors.


Firm _____

Street _____

City _____ State _____

Att: Mr. _____ Dept. _____

When inquiring check CP 5296 on handy form, pgs. 2-3

Remove  4 Bolts ...

and there's the impeller!

MORRIS
Type R
SLURRY
PUMP

No need to disconnect the piping!



Morris Type R is the slurry pump whose impeller can be removed without disturbing the suction and discharge piping or the bearings! To get at the impeller and renewable shaft sleeve, you simply loosen four outside clamping bolts — slip them out of disc slots — take off the end cover. Impeller unscrews from shaft threads; shaft sleeve is removed through end cover opening.

At no point do you have to dismantle the piping. Lay-up time costs are less . . . pump is back in service quicker.

Use the Morris Type R in Your Chemical Operations

Morris Type R is the product of 88 years' experience in designing and building materials-handling pumps. It is specifically engineered to handle mixtures containing abrasive solids and chemicals in suspension, including acid slurries and sludges and slurries containing soda ash, ore concentrates, tailings, slag, etc.

Write for specifications, capacities, performance charts, and other helpful information. Ask for Bulletin 181.

MORRIS MACHINE WORKS
Baldwinsville, N. Y.
Branch Offices in Principal Cities

MORRIS Centrifugal Pumps

When inquiring check CP 5297 on handy form, pgs. 2-3

MATERIAL HANDLING

**Streamlined, torque drive,
no clutch pedal featured
in lift truck tryout**

Uses: Research model of 7000-lb capacity fork lift truck recently exhibited was designed primarily as an experiment to incorporate as many features as possible and to determine reaction of industrial public.

Features: Streamlined design, a torque converter that eliminates need of a clutch and clutch pedal, lightweight, sturdy frame are included among features.

Description: In construction of the X-70, the sides of the frame between the front and rear wheels are turned under and form an oil reservoir, or sump, on one side of the truck and the fuel tank on the other. Arrangement is claimed to result in a lighter, rugged frame and also provides a high degree of accessibility to the engine compartment.

Truck has counter-balanced hood hinged at the rear counterweight and can be completely removed by a single bolt on either side. Lifting of hood automatically actuates a light for further illumination. Spring-balanced assembly of hood can be easily adjusted.

Automatic transmission does away with gear shift lever. Driver has clear access to seat from both sides of truck. Power can be changed from forward to reverse (or vice versa) without coming to a com-



Automatic transmission eliminates clutch, pedal

plete stop. Extra-large rear steer wheels make truck easier to operate, manufacturer reports. Built-

PRODUCT SAVER
MAN SAVER
FLOOR SAVER

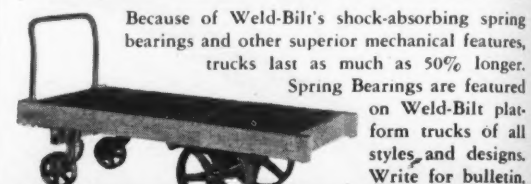
Weld-Bilt

Special tempered spiral springs keep load level while absorbing shocks of an uneven floor.

SPRING BEARING TRUCKS

Here's the answer to your problem of moving materials more efficiently, with maximum protection to product, trucker and floor.

On Weld-Bilt Spring Bearing trucks, your materials move without jarring or vibration. Your truckers work faster and easier, with less fatigue. Floor drains and door sills are protected against damage, as wheels "step" over obstruction.



WEST BEND EQUIPMENT CORP.
MATERIALS HANDLING ENGINEERS
322 WATER STREET, WEST BEND, WISCONSIN

When inquiring check CP 5298 on handy form, pgs. 2-3

Prices for $\frac{3}{8}$ yard

Shovel loader

start at \$2332 (f.o.b. factory)

FOR COMPLETE UNIT INCLUDING TRACTOR!

This versatile, low-cost bulk-handling and maintenance tool does so many things so efficiently that practically every industrial plant will find it a highly profitable investment.

Shovel loader mounts on Case, Minneapolis-Moline, Oliver or Sheppard-Diesel tractors. Capacities range from $\frac{3}{8}$ to 2 yards. Light material bucket, forks, crane hooks or sweeper attachments are available.

Write for Bulletin AD-32 B for complete information

THE BAKER-LULL CORP.
Formerly the Lull Manufacturing Company
315 WEST 90th ST., MINNEAPOLIS 20, MINN.
A Subsidiary of the Baker-Raulang Co.
Cleveland 2, Ohio

Baker Lull
handling equipment

When inquiring check CP 5299 on handy form, pgs. 2-3

CHEMICAL PROCESSING

MATERIAL HANDLING

in two-way radio is included in research model. Also included are an engine-hour meter for accurately determining how long truck is in operation, and a built-in tail light which can function as a stop light or warning flasher light.

(Model developed by the Industrial Truck Div., Clark Equipment Co., Dept. CP, Battle Creek, Mich. It is not available for industrial use, although manufacturer welcomes design suggestions.)

Competition increases efficiency of fork truck operators, detects mishandling . . .

increased safety, decreased operating costs and maintenance are other advantages of program

A unique program involving active competition among fork truck drivers and that has been responsible for decreased operating costs and equipment maintenance charges has been put into operation at the American Finishing Company's plant in Memphis, Tenn.

Under the program, fork trucks are assigned to specific drivers. If any driver is caught handling the equipment in a rough manner, or damaging material with his equipment, he receives a warning. A second offense means a one-day layoff; the third offense demands a one-week layoff. A fourth offense automatically calls for the employee's dismissal. However, the second or third offense could conceivably call for discharge if the extent of damage or the employee's attitude warranted it.

When the company receives a new truck, the selection of a driver is contingent upon his previous safety record and his cost record of truck operation. In assigning new equipment to the driver, the company points out the reasons for his selection.

Proof of the success of the operation: competition among employees is so keen for a truck job that it takes five years to become eligible.

Operators are enthusiastic about the competition, and the company finds costs have tumbled. For example, cost of operation of a single truck for an entire year, including amortized cost of the truck, is only \$1358.94. In addition, it must be realized that in some departments this material handling equipment runs during three 8-hr shifts, bringing down the average cost to \$452.98 for one year at an 8-hr/day basis.

The company has also realized further benefits from the competitive program. Carloading time has been slashed from 28 to 1.3 man-hours, thus releasing workers for more productive work within the company. The trucks have also increased use of storage space 250 per cent; a truck now stores 54 palletized rolls in space previously occupied by fifteen.

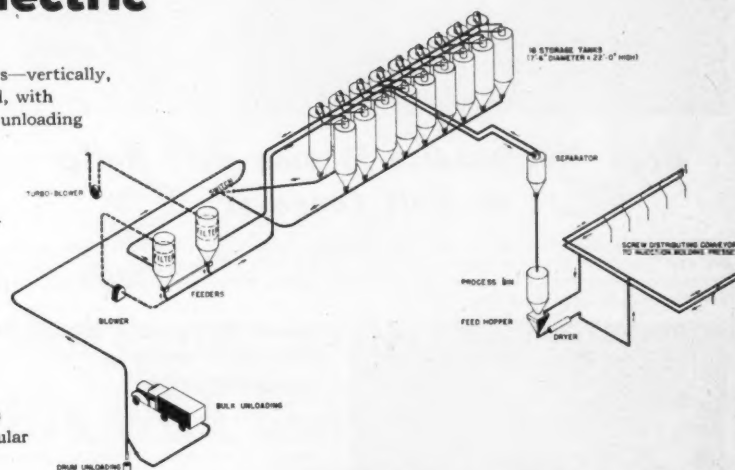
(Fork trucks used at the company are products of the Elwell-Parker Electric Co., Dept. CP, 4205 St. Clair Ave., Cleveland 3, Ohio . . . or for more information reader may simply check CP 5300 on convenient Reader Service slip located between pages 2 and 3.)



from ^{THE}AIRVEYOR[®] at Western Electric

- 1 The Airveyor moves plastic powders—vertically, horizontally, around corners, overhead, with centralized push-button control—from unloading to storage and processing.
- 2 Seals dust in—contamination out. Prevents explosions, avoids respiratory hazards.
- 3 Cleanliness all along the handling route—without spillage—to multiple points of storage and use.

The Airveyor has all these advantages for handling dry, pulverized and granular materials.



The Western Electric Company plant in Indianapolis can now handle up to 10,000 pounds of plastic powders an hour, with all the advantages listed above. The Airveyor system of piping extends nearly 400 feet.

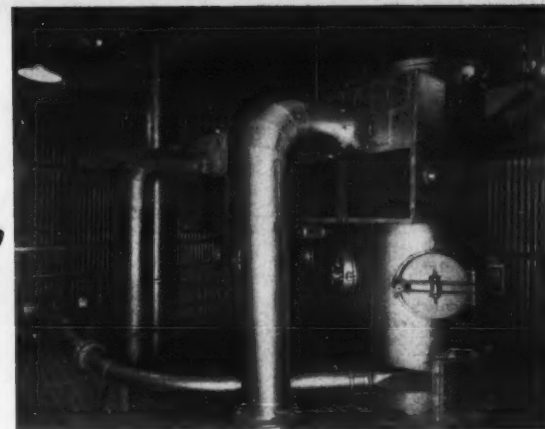
You may not be handling plastic powders—but most dry, pulverized and granular materials can be conveyed better, at less cost, and without contamination with the Airveyor.

Write today for further information—and preliminary engineering studies—for handling your dry process materials.

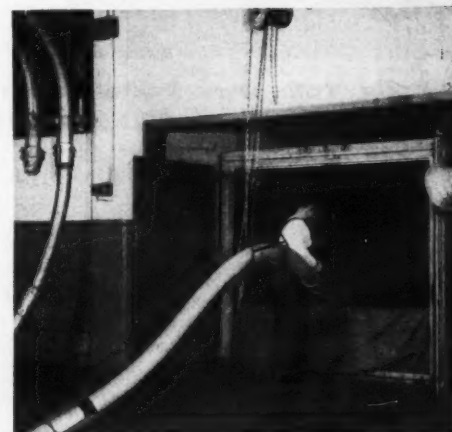
Fuller

FULLER COMPANY, Catasauque, Pa.
120 So. LaSalle St.—Chicago 3
420 Chancery Bldg.—San Francisco 4

A-145
1675



Four compartment, continuous Airveyor filters



Bulk unloading from truck, using the Airveyor

DRY MATERIAL CONVEYING SYSTEMS AND COOLERS—
COMPRESSORS AND VACUUM PUMPS—
FEEDERS AND ASSOCIATED EQUIPMENT

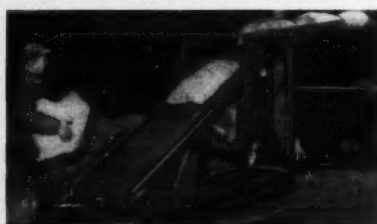
When inquiring check CP 5301 on handy form, pgs. 2-3

When You Want Conveyor
EXPERIENCE
... Check with **STANDARD CONVEYOR**



Keep Merchandise Moving with Roller or Belt Conveyor

• With an experience record of more than 45 years—Standard is known as headquarters for any "package" conveyor need—can help you to handle packages, parts, units—faster—at lower cost with gravity or power roller, belt, slat, chain, wheel or pushbar conveyors. For complete information write Dept. CP-123.



Load-Unload • Stack • Elevate with a HANDIPILER

• Handles sacks, boxes, cases, cartons, bundles—conveys up or down. Built in 14 and 24 inch widths; boom is designed to pile cartons up to 17 ft.—sacks to 12 ft.—projects into cars, trucks, trailers. Handles commodities up to 135 lbs. Write Dept. CP-123 for Bulletin 63-D,

Build Your Own System with Standard HANDIDRIVE Pre-Built Units...



• Handidrive belt, live roller and gravity roller conveyors consist of drive and take up units, and roller assemblies, intermediate framework, supports and hanger, to make complete conveyors—or to convert present gravity conveyors to power conveyors. Write for Bulletin 63-D, address Dept. CP-123.

STANDARD CONVEYOR COMPANY
General Offices: North St. Paul 9, Minnesota
Sales and Service in Principal Cities



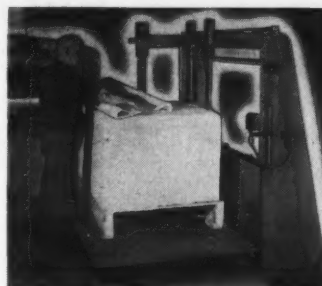
ROLLER • BELT • SLAT • CHAIN • WHEEL
PUSH-BAR • SECTIONAL
PORTABLE CONVEYOR UNITS:
HANDIBELT • HANDIPILER
INCLINEBELT • LEVEL BELT • EXTENDOVEYOR
UTILITY BELT-VEYOR • HANDI-DRIVE
CONVEYORS VERTICAL LIFTS • PNEUMATIC TUBE SYSTEMS

When inquiring check CP 5302 on handy form, pgs. 2-3

MATERIAL HANDLING

Keeps material level with worker

Lift automatically keeps top of material handled at working level. Bending and stooping are reduced and work visibility improved. Machine handles weights up to 3000 lb and can be



Handles weights to 3000 lb

set into floor to bring platform flush, or can be placed directly on floor.

(Lift is product of Southworth Machine Co., Dept. CP, Portland, Maine... or for more information check CP 5503 on handy form, pages 2 and 3.)

Moving material is constantly blended

Uses: For transporting materials not readily handled by belt, screw, or other type conveyors.

Features: Conveyor is mounted on springs and vibrated by electric motor and specially-designed linkages.

Description: Conveyor oscillates with continuous series of forward-and-up, downward-and-back

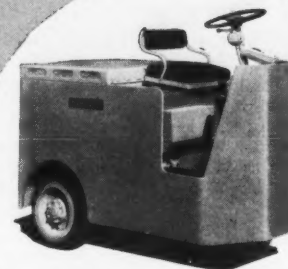


Oscilveyor is 64 ft long

movements. It moves material by throwing it forward short distances in making its cycle.

Number of vibrations per minute

New MERCURY "TUG" ELECTRIC TRACTOR



Model 550

Available in Two Capacities: 2000 and 2500 lbs. D.B.P.



For complete information write:

MERCURY MANUFACTURING COMPANY
4020 S. Halsted St., Chicago

The compact, versatile, new MERCURY "Tug" electric tractor. Features *automotive type steering*... 4-speed magnetic contactor control with timed acceleration and controlled plugging... new type double reduction drive with demountable wheel rim and tire assemblies... self-energizing hydraulic brakes and new type semi-elliptic spring suspension. Available in twin-3 wheel, or 4 wheel model with wide front tread.

When inquiring check CP 5304 on handy form, pgs. 2-3

Wallace & Tiernan MASSOMETER

FOR METERING
FREE FLOWING
SOLID MATERIALS



Pneumatic
Recording
•
Maximum
Capacity
225 lb. per min.

Accuracy $\pm 1\%$
•
Overall Height—24½ in.

Write today for Description

WALLACE & TIERNAN
COMPANY INC.
25 MAIN STREET, BELLEVILLE 9, N.J.

When inquiring check CP 5305 on handy form, pgs. 2-3

CHEMICAL PROCESSING

Save time! Prevent accidents!

LIFT AND DUMP MECHANICALLY

BAGS
BARRELS
DRUMS
BOXES

REDUCE HANDLING COSTS with a Cesco Dumper. It handles up to 100 loads per hour; has a lifting cap. ranging from 100 to 1500 lbs. Both single- and multi-purpose portable models are built in standard dumping heights from 5 to 12 ft. Stationary models up to 16 ft. dumping heights. Push button controlled. Write for catalog.

ESSEX CONVEYOR, INC.
101 Colden Street • Newark, New Jersey
COLSON EQUIPMENT & SUPPLY CO.
1217 Willow Street • Los Angeles 13, California



When inquiring check CP 5306 on handy form, pgs. 2-3

YOU GET STEADY FLOW WITH SPO AIR VIBRATORS



These low-cost units provide dependable hard-hitting vibration to keep bulk granular or powdered materials moving. SPO vibrators prevent jams in bins, hoppers and chutes . . . assure steady material flow at all times . . . eliminate production bottlenecks.

Long-lasting SPO vibrators incorporate a special corrosion-proof liner for full power starting, high speed operation and low air consumption. A complete range of types and sizes is available to meet all vibration needs.

1460-SI

Write today for Bulletin 50 for complete details.



SPO INCORPORATED

6531 Grand Division Avenue • Cleveland 25, Ohio

When inquiring check CP 5307 on handy form, pgs. 2-3

DECEMBER, 1953

MATERIAL HANDLING

and forward throw are critical factors in handling different materials. Incorrect vibration-throw combinations could result in flow of only top layer material.

(Oscilveyor is product of Gifford-Wood Co., Dept. CP, Hudson, N. Y. . . or for more information check CP 5308 on handy form, pages 2 and 3.)

**Headroom is minimized,
power increased
in walkie . . .**

unit moves 6000 lb loads,
takes ramps in its stride

Uses: For general materials handling operations and where ramps must be navigated. Handles loads in confined areas.

Features: Short headroom and twice the power in 48 per cent less space are features of electric-powered walkie, reported by manufacturer. Minimum maintenance (no under truck adjustments) and lifetime-sealed bearings are also listed.

Description: Walkie unit, Jack-Lift Electric, has a compound-wound 1 1/4 hp traction motor for



Has 1 1/4 hp motor for handling
6000 pounds

controlled speed on level floors, added boost for use on ramps. Higher speed operation under heavy loads means that number of loads handled is relatively independent of the variation of weights involved, thus assuring faster operation.

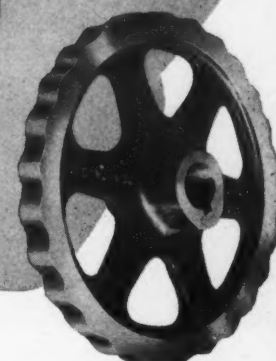
(Development of Lewis-Shepard, Dept. CP, Watertown, Mass. . . or for more information check CP 5309, pgs. 2 and 3.)

"Beaualloy"

Heat Treated Alloy Steel average yield
point 150,000 psi; elongation 6%.



"TRAC-PULL"
wheels, no teeth to wear out.



"DURA-TREAD"
Chains with added wear-
ing surface on barrel.

3 points

that assure up to 2500% longer life with BEAUMONT CHAINS

A combination of wear resistant metal and unique patented design keeps Beaumont bucket elevators operating when other conventional types wear out under highly abrasive conditions.

One large manufacturer installed Beaumont equipment in place of malleable iron and saved over 95% in the handling of Pyrites.

Three basic reasons make this possible. 1. Beaumont "Beaualloy" alloy steel is particularly resistant to abrasive action. 2. Beaumont "Dura-Tread" chain barrels provide additional wearing surface at the point where wear is greatest. 3. Beaumont "Trac-Pull" wheels are a new departure in sprocket design that eliminates the abrasive action inherent in conventional tooth-sprocket types. These advantages mean less maintenance, less outage time, less cost per ton handling and less worry about breakdown. Beaumont "Dura-Tread" chain is also available in corrosive resistant metal and malleable iron where the application is not abrasive. They are stronger, lighter, last longer and with "Trac-Pull" wheels are substitutes for standard chains.

If your problem is moving chemicals, fertilizers, coal or any other abrasive and corrosive solids, Beaumont material handling equipment will save you money.

Why not investigate the possible savings . . . Write today for Bulletin 4140.1 on Beaumont Bucket Elevator Equipment.



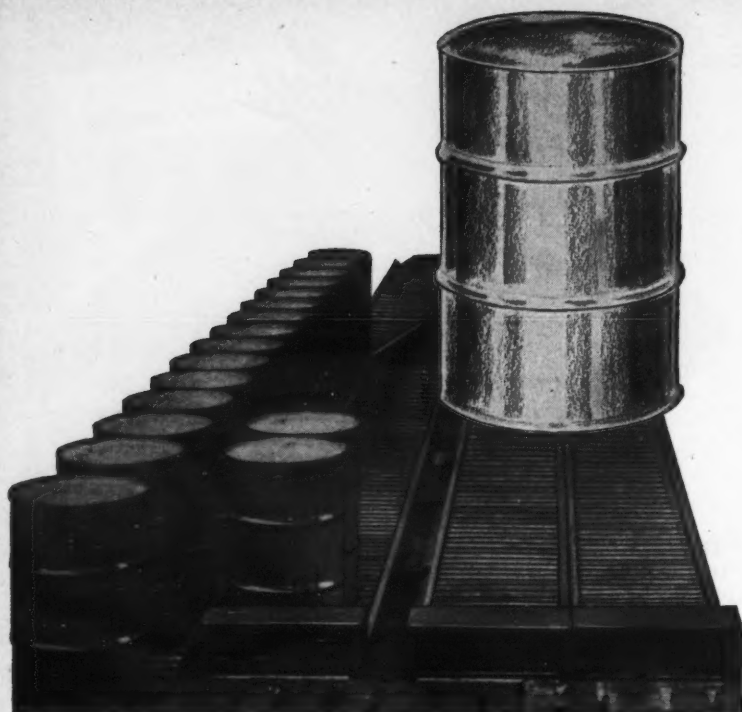
Beaumont

BIRCH COMPANY

1516 RACE STREET, PHILADELPHIA 2, PA.

DESIGNERS—MANUFACTURERS—ERECTORS BULK MATERIAL HANDLING SYSTEMS

When inquiring check CP 5310 on handy form, pgs. 2-3



Handle Drums with Ease ...ON **ALVEY** CONVEYORS

You can simplify your drum traffic, eliminate dangerous and costly man-handling by putting drums on Alvey Conveyors.

Whether its drums, bags, boxes, cartons, sacks—or any other packaged goods you are moving, it may pay you to call in an Alvey engineer. He will show you how Alvey is helping other companies like yours. No obligation, of course.

ALVEY CONVEYOR MFG. CO.
9308 Olive St. Rd., St. Louis 24, Mo.

BRANCH OFFICES IN PRINCIPAL CITIES

ALVEY

When inquiring check CP 5311 on handy form, pgs. 2-3

MATERIAL HANDLING

Retractable third wheel eases load carting on hand truck

Uses: For carting and wheeling loads with hand truck.

Features: When retractable third wheel is extended, truck can be operated in a 3-point position, thus preventing load from



Third wheel retracts

bearing on operator. When stopped in this position, truck can be restarted without the usual physical effort to overcome dead load-weight.

Description: For conventional use, retractable wheel fits snugly against magnesium truck frame. Nose unit of truck extends beyond the wheels on either side, preventing flexible loads from binding against the wheels. All parts are mechanically joined and are easily replaced when worn. No weld maintenance is ever required.

(Development of Magline, Inc., Dept. CP, Pinconning, Mich. . . . or for more information check CP 5312 on handy form, pages 2 and 3.)

Heavy-duty carriers allow easy access to contents

Uses: To eliminate congestion in plant areas, yet provide complete visibility of material.

Features: For easy access to contents, sides drop down on heavy-duty hinges.

Description: One ton capacity carriers may be moved as single

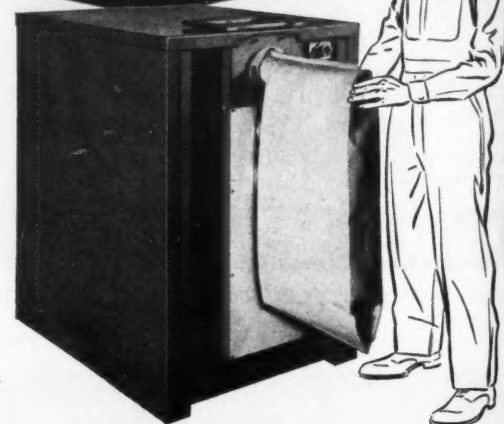


NO SCOOPING

NO SEWING

NO TIEING

CUT BAG PACKING COSTS



AUGER-MATIC Bag Packer

Quickly fills self-closing bags to the desired weight. Saves time in filling and eliminates need for sewing or other expensive bag closing equipment.

The AUGER-MATIC Bag Packer has a multi-twist auger which can quickly be changed to pack any material from powder to pellets.

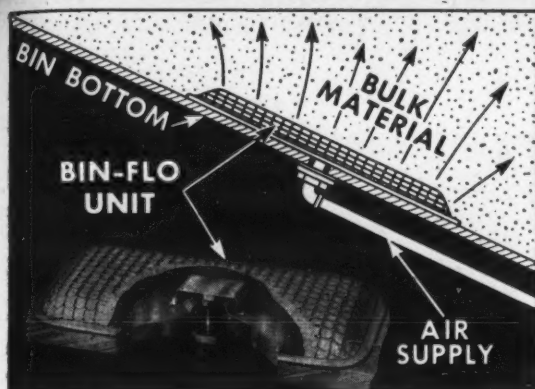
AUGER-MATIC Packing reduces dirt and waste . . . a time and labor saver. Packer can easily be moved from one filling point to another.

Send for descriptive literature.

E. D. CODDINGTON MFG. CO.
5036 NORTH 37TH STREET • MILWAUKEE 9, WISCONSIN

When inquiring check CP 5313 on handy form, pgs. 2-3

CHEMICAL PROCESSING



BIN-FLO

USES SMALL VOLUME OF AIR AT LOW PRESSURE

KEEPS BULK MATERIALS MOVING

BIN-FLO units in bins, chutes, hoppers, etc., restore flow characteristics to dry, finely ground materials which tend to pack or bridge in storage. Types for all materials and conditions. No moving parts; simple installation; negligible operating cost; no maintenance cost.

BIN-DICATOR bin level indicator—"The Eyes of the Bin"—automatically reports levels of materials in storage; automatically controls filling machines; prevents waste.

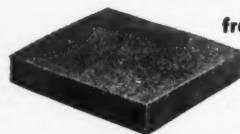
THE BIN-DICATOR CO.

13946-D Kercheval • Detroit 15, Mich.

NEW
20-PAGE
BOOK
FREE

When inquiring check CP 5314 on handy form, pgs. 2-3

Armstrong's VIBRACORK CUSHIONS VIBRATION



from Hydraulic Presses, Pumps, Compressors, and many other types of Machinery and Equipment

... ACTUALLY FLOATS THE LOAD ON MILLIONS OF AIR CELLS!

Vibracork is a resilient machinery isolation cork plate made of pure cork granules, compressed and baked under pressure.

Convenient to stock—Standard sheets, 12" x 36"; Standard density 2" and 3" thick; Heavy density, 1", 2" and 3" thick.

Easy to use—Can be cut to size on the job with an ordinary hand saw.

Loading range—Standard density, 1500# to 4000# per sq. ft.; Heavy density, 5700# to 8500# per sq. ft.

Availability—Immediate delivery. Korfund is sole distributor for the United States.

For installation data and further information, ask for Bulletin VC-500.



THE KORFUND CO., INC.

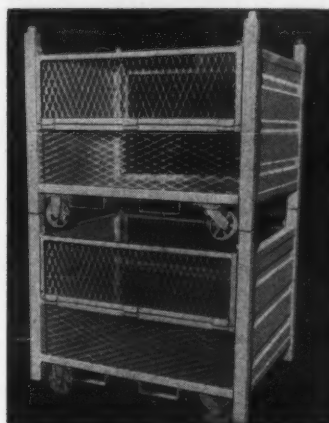
48-13E, Thirty Second Place • Long Island City 1, N. Y.

When inquiring check CP 5315 on handy form, pgs. 2-3

DECEMBER, 1953

MATERIAL HANDLING

unit or as part of a trackless train. They may be stacked up to six high with a standard fork truck.



May be stacked six high

Wire mesh sides provide complete visibility. Corner posts are made of seamless tubing. Corrugated ends and base provide double strength.

(Carriers are produced by the Rack Engineering Co., Dept. CP, Connellsville, Pa. . . or for more information reader may simply check CP 5317 on convenient Reader Service slip between pages two and three.)

Increases tractor speed to 34 mph . . .

overdrive easily installed in present field units

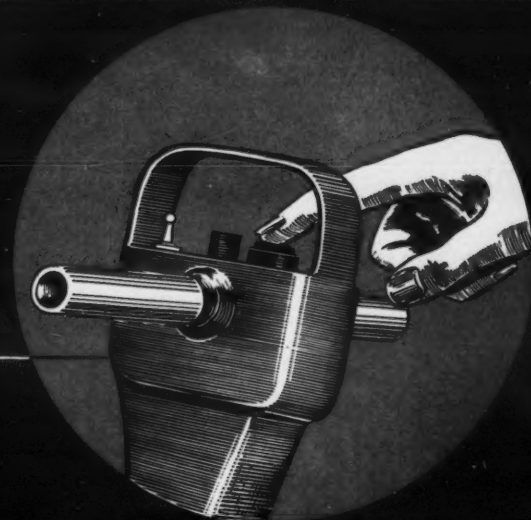
Overdrive for manufacturer's DW20 four-wheeled tractors gives top speed of 34 mph. Combined with present standard transmission, overdrive results in tractor range of 10 speeds forward and 2 in reverse.

Attachment is mounted between engine and transmission and is controlled by manually operated shift lever. Available on new machines or for installation on units now operating in the field.

(Overdrive is product of Caterpillar Tractor Co., Dept. CP, Peoria 8, Ill. . . or for more information reader may simply check CP 5318 on convenient Reader Service slip between pages two and three.)

STUEBING DESIGNED • STUEBING ENGINEERED • STUEBING BUILT

Hydrolectric LIFT TRUCKS



give you true "Finger Tip Control"

"Finger Tip Control" originated with Hydrolectric motorized hand trucks in the 30's. The phrase has since been copied, but the ease of operation never duplicated. True finger tip control can be realized only when the truck is easy to steer, and braking can be accomplished immediately without changing the position of the handle. Good finger tip control is not only a matter of button operation, but closely dependent on the ease of steering and quick braking—braking with the handle in any position—not just up or down. Truly, the Hydrolectric truck was built with the operator in mind—two speeds forward and two speeds in reverse, plus the dynamic brake are simplicity at its best—assuring greatest safety for the most inexperienced operator. Turning, backing, stopping, steering in close quarters, the Hydrolectric trucks operate smoother, easier, and are more responsive and effortless than any similar lift truck.



Want more facts about this fine power lift truck? Write to:

LIFT TRUCKS
INCORPORATED

2423-31 SPRING GROVE AVE.
CINCINNATI 14, OHIO

There is a model for every purpose to handle any kind of material.

When inquiring check CP 5319 on handy form, pgs. 2-3

**HEAT
ON?**

**TRANSFER IT
QUICK**

*

**with
this
Super
Slide
Chart**



*Get the information you need on physical properties, sizes and gauges, cross-sectional area, velocity constants, pressure, weights and other technical data on Carpenter Stainless Tubing for Heat Exchanger applications. It's all condensed in this handy slide chart. Write for it today, no obligation of course.

THE CARPENTER STEEL COMPANY

Alloy Tube Division, Union, N.J.

When inquiring check CP 5320 on handy form, pgs. 2-3

*for the
laboratory*



Small sample is placed in unit between magnet poles

magnetic properties of isotopes analyze chemical mixtures

**High resolution spectrometer useful for
fluorine chemistry and other chemical
bonding determinations**

Using established magnetic characteristics of various isotopes of the elements, a penetrating method of analysis has been developed for determining molecular structure and identifying and measuring components in a mixture. It is capable of distinguishing between many structural isomers. Method is applicable to a vast number of compounds containing hydrogen and fluorine, and to a host of compounds containing other isotopes having favorable characteristics.

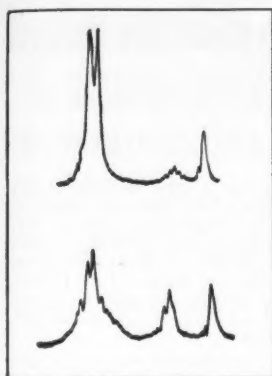
Based on the fact that various isotopes of the elements can be separately identified according to their differing nuclear gyro-magnetic constants, Nuclear Magnetic Resonance Spectroscopy measures the response signal of atomic nuclei in a sample subjected to radio frequency. When subjected to a suitable frequency, the RF signal of the sample provides a "fingerprint" of its components when scanned with an appropriate magnetic field which sweeps through the resonance

value of component isotopes. Each compound has individual identifying characteristics under specific conditions, in which the variables permit absolute identification of various molecular structures.

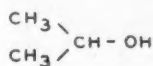
Characteristics of Isotopes

Just as there is a certain mass and electric charge associated with each isotope, so there is a spin, or angular momentum, associated with each isotope. When the value of this spin is not zero for a specific isotope, it has a magnetic moment, and the ratio of magnetic moment value to spin value is called the gyro-magnetic ratio for that particular nucleus. Ratio is a constant for a given atomic nucleus. This fact permits separation and identification of the various isotopes.

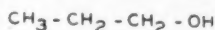
When a group of nuclei possessing given gyro-magnetic properties are placed in a magnetic field of an appropriate strength, the nuclei resonate when subjected to RF energy of a particular frequency. When the resonance signal is plotted (or recorded) vs the external magnetic field strength, a magnetic spectrum is obtained which clearly defines the molecular structure under examination. Variables in this spectrum may include number of lines and their



ISOPROPYL
ALCOHOL



n - PROPYL
ALCOHOL



Traces show difference between isomers

spacing, absolute position of lines (shift due to difference in chemical bonding), relative amplitude of signal response, spin-spin interactions, and line width. Assignment of specific values to these characteristics for known compounds can lead to group identification in unknown compounds.

In order to make measurements of this type, instrument must produce radio-frequency energy with high stability, and a stable magnetic field of suitable strength and uniformity. Suitable means for controlling these factors and recording the "response" of the sample being analyzed is also necessary.

The Model V-4300 High Resolution n-m-r (nuclear magnetic resonance) Spectrometer is a basic laboratory research instrument which is used for rapid, non-destructive analyses of chemical bonding situations. Standard model operates at a crystal-controlled fixed radio-frequency having a value which is suitable for studies of compounds containing hydrogen (protons) or fluorine. Additional or substitute radio-frequency units and related equipment are available on special order for work with other isotopes. Instrument is capable of resolution in excess of one part in 10 million.

Although special RF units are available for operation at any specified fixed-frequency up to 40 megacycles, standard model operates at a highly stable crystal-controlled frequency of 30 mc, corresponding to a resonant field of approximately 7050 gauss for protons and 7500 gauss for fluorine. The active sample volume required for maximum sensitivity is only 0.01 ml, and the minimum number of protons or fluorine nuclei required for useful observation of the response signals is 10^{18} .

Designed for the study of narrow lines, chemical shifts and line splittings, the Model V-4300 can also be used under special conditions to derive other useful information. Studies at different temperatures of equilibrium mixtures containing molecular species reversibly convertible from one to the other can lead to information concerning a) equilibrium constants, b) energy separations of reacting species, c) rates of reaction, and d) potential barrier heights.

(Continued on page 100)



in 25 years...

2,228,460,000,000
cubic feet of air delivered!

without major mechanical
difficulty of any kind

**EVERY CLARAGE FAN
EVERY CLARAGE WASHER
STILL ON THE JOB!**

In June 1928, Fidelity-Philadelphia Trust Company, placed in operation its Clarage equipment —40 fans and 4 air washers.

Today the same 40 Clarage fans and the same 4 Clarage washers provide efficient, dependable ventilation for this great office building —and they are apparently good for another quarter-century of service.

In handling over two and one quarter trillion cubic feet of air, not a single replacement has been made, nor a single major mechanical difficulty encountered.

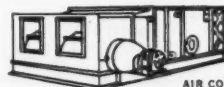
Thanks to adequate maintenance on the part of Fidelity management, this Clarage equipment has had the opportunity to prove our slogan: "You can RELY on Clarage"—RELY on Clarage to cost you far less in the long run.

Write us about your air handling and/or air conditioning needs...CLARAGE FAN COMPANY, Kalamazoo, Michigan.

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AIR CONDITIONING



INDUSTRIAL
HEATING



UNIT
AIR CONDITIONING



VENTILATION



AIR CLEANING

You can Rely on...

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Headquarters for
Air Handling and
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SALES ENGINEERING OFFICES IN ALL PRINCIPAL CITIES • IN CANADA: Canada Fans, Ltd., 4285 Richelieu St., Montreal

When inquiring check CP 5321 on handy form, pgs. 2-3

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Chicago 80, Illinois

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When inquiring check CP 5322 on handy form, pgs. 2-3

... run d-c motors
from a-c lines

with Variac Motor Speed Controls

- ★ 4 Models from 1/15 to 3/4 h-p DC Motors
- ★ Extra Fast Start-Stop-Reverse
- ★ No Electronic Tubes —no Warm-up Required
- ★ Speed Range 5-10 rpm to 15% Above Rated
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Write for the VARIAC Speed Control Bulletin

GENERAL RADIO COMPANY

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Cambridge 39, Massachusetts

90 West Street NEW YORK 6

920 South Michigan Avenue CHICAGO 5

1000 North Seward Street LOS ANGELES 38

When inquiring check CP 5323 on handy form, pgs. 2-3

LABORATORY

Scintillation counter is lightweight for portable units

Uses: Lightweight unit, which is 2" in diameter and 6½" long, is designed for use in portable equipment.

Features: Smaller diameter offers greater ease and economy in providing lead shielding, plus a more convenient size for hand held probes. Other features are a threaded end for rapid attachment of accessories, and construction of strong, lightweight aluminum alloy which is black anodized to provide an attractive and resistant finish.

Description: Phosphors in unit are used in conjunction with a RCA 6199 phototube, which is pressed firmly, with several pounds pressure, against the plexiglass crystal mounting and a small amount of DC-200 silicone placed between the surfaces.

(SC-33 Miniature Basic Unit is a product of Nuclear Research and Development, Inc., Dept. CP, 6425 Etzel Ave., St. Louis 14, Mo. . . or for more information reader may simply check CP 5324 on handy Reader Service slip located between pages 2 and 3.)

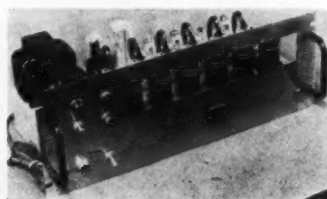
Novel tubes used in six-digit counter . . .

up to 30,000 counts/second
can be handled

Uses: High speed counter can be used for counting pulses or sine waves of one volt or more.

Features: Maximum counting rate is 30,000 counts/second with a resolving time of 25 microseconds.

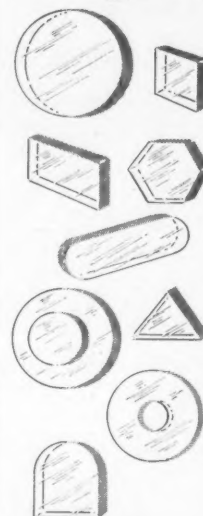
Description: Counts to 999,999 are registered directly on indicating electronic tubes. Input



Accepts virtually any wave shape
for counting

Call SWIFT for SIGHT GLASSES

precision-ground in
perfectly true circles



Let us supply you with Perfectly True Circles precision-ground from heat-resistant Pyrex Polished Plate Glass . . . used by major chemical companies from coast to coast. Resist clouding, pitting, chemicals (except HF and strong hot caustic solutions).

We can deliver immediately specially cut round, square, rectangle or odd-shaped Sight Glasses in 8 thicknesses (1/8" to 1"), sizes up to 24" x 60". Write, wire or phone for quotation. Ask for Sight Glass Bulletin.

SWIFT Glass Division

SWIFT LUBRICATOR COMPANY, INC., ELMIRA, N.Y.
330 Tenth St., San Francisco 3 • 140 Boylston St., Boston 16
807 Mateo St., Los Angeles.

When inquiring check CP 5325 on handy form, pgs. 2-3

Strange Perhaps... But They Are Related!

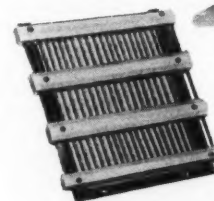
Masland Duran . . . "Folded-and-Formed" Heating Elements. What's the connection? Well, in the manufacture of Duran, the popular all-plastic material for fine upholstery, the process includes heating and curing in ovens equipped with Trent Patented

"FOLDED-and-FORMED" Heating Elements

This is another example of a quality product produced with the help of these quality heating elements . . . unequalled in efficiency, durability and economy.



"Folded-and-Formed" Heating Elements are made in Standard and Custombuilt Racks to meet any installation or K. W. requirement. What is your heating problem?



TRENT INC.
Electrically Heated Industrial Equipment
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When inquiring check CP 5326 on handy form, pgs. 2-3

CHEMICAL PROCESSING

ALCONOX.....

The NUMBER ONE Name in LABORATORY DETERGENTS

The tested, proven, accepted fast-acting detergent and wetting agent.

For less than 2½ cents a gallon, all laboratory glassware, metalware, porcelain, silverware, etc., can now be kept sparkling clean and film-free with a minimum of effort.

In addition, Alconox works with equal effectiveness in either hard or soft water, hot or cold—and is absolutely harmless to human tissue . . .

Try it—Buy it—and You'll Buy it again.

Available in

Box of 3 lb.	— price \$1.95
Carton (12 x 3 lb.)	— ea. 18.00
Bag of 50 lb.	— lb. .40
Drum of 100 lb.	— lb. .40
Barrel of 300 lb.	— lb. .37

If your dealer cannot supply you, write for literature and samples.

Dept. CP-12



When inquiring check CP 5327 on handy form, pgs. 2-3

NOW IT'S UNBREAKABLE!

DWYER
SERIES 1211
Flexible
**SLACK-TUBE
MANOMETER**



Just roll it up
and tuck it away!

- Scale—convex spring steel—holds Slack-Tube rigid for convenient use and easy reading—regardless of length—yet permits rolling into small space for pocket or service kit
- Zero Adjustment—easily obtained by sliding spring-steel scale in lipped saddle.
- Connections—¼" pipe thread openings and rubber tubing adapters provided.
- Tough Vinyl Plastic Body—will serve for years. Several inches allowed for scale adjustment.

- ✓ Extremely Accurate
- ✓ Easy to read
- ✓ Standard ranges from 8 to 120 inches in water or mercury

Write for complete information

F. W. Dwyer Mfg. Co.

335 S. Western Ave. Chicago 12, Illinois

When inquiring check CP 5328 on handy form, pgs. 2-3

LABORATORY

circuit of counter has adjustable sensitivity. It responds to changes in input level — thus is not limited to any specific input wave shape. One volt (rms) sine waves can be counted at speeds from 5 to 30,000/second. Pulses can be counted at any rate below 30,000/second. Special terminal permits signals which vary at very slow DC rates to operate counter.

Controls are located at left of panel for one hand operation. Three push buttons operate "start," "stop," and "reset." Sensitivity adjustment is on rear of chassis. Each decade is built on individual sub-chassis for easy servicing and includes one EIT counting tube and one 5964 pulse-shaping tube. Power supply and signal-handling stages are on the main chassis and these circuits include three 5964 tubes, one 6AL5 tube and one 5Y3GT tube.

Counter is designed for standard rack mounting. It includes a dust cover. Unit measures 7 x 19 x 8" deep and weighs 25 lb. Powers are provided by 95-130 v, 50/60 cps AC.

(High-speed counter is a development of Research & Control Instruments Div., North American Philips Co., Inc., Dept. CP, 750 South Fulton Ave., Mount Vernon, N. Y. . . or for more information reader may simply check CP 5329 on handy form located between pages 2 and 3.)

Provides useful info on lab equipment

Intended as a handy guide to several frequently-used items of laboratory equipment, 4-page booklet devotes one entire page to a description of gas analysis apparatus and associated reagents. The discussion includes both laboratory and portable models.

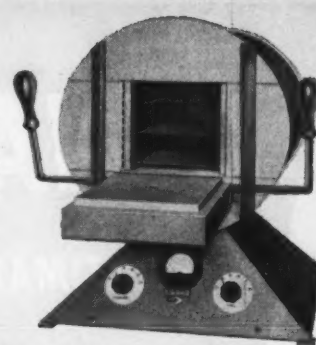
Also included are descriptions of box-muffle and unit-package furnaces, a high frequency induction heater, a unit-package carbon train, and an automatic shaking unit.

Bul 328 is issued by Burrell Corp., 2223 Fifth Ave., Pittsburgh 19, Pa. When inquiring specify CP 5330 on handy form, pages 2 and 3.



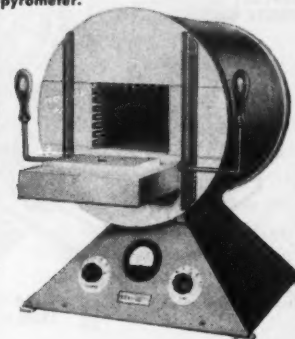
CRUCIBLE FURNACE

Used for melting small quantities of metals. Maximum temperature 1950° F. Five standard sizes. Other types available for 2300° F. operation.



AIR DRAW FURNACE

Temperatures to 1250° F. A high speed fan circulates the air assuring uniform heating. 48 Steps of Temperature control — Indicating pyrometer.

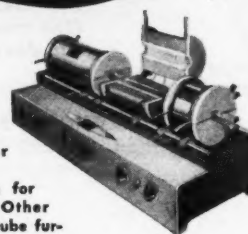


MUFFLE FURNACE

Temperature to 1850° F. Features include . . . low heat loss . . . rapid heating . . . better control with a 36 step tap-changing transformer . . . indicating pyrometer. Four standard sizes.

ORGANIC COMBUSTION FURNACE

Three separately controlled tube furnaces mounted on slide rails, for use individually or as one assembly. Hinged construction for easy operation. Other sizes and types of tube furnaces available for temperatures to 2600° F.

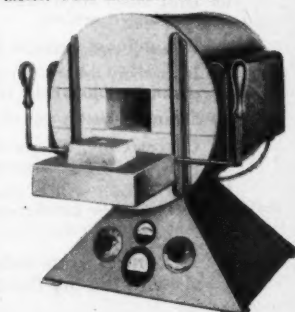
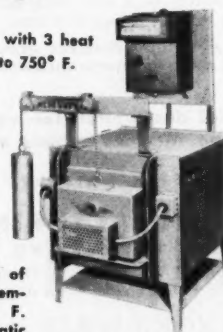


HOT PLATES

7 Standard sizes, each with 3 heat control. Temperatures to 750° F.

MULTIPLE UNIT FURNACE With Controlling Pyrometer

Specially designed for heavy laboratory work. Heating on five sides of the furnace chamber. Temperatures to 1850° F. Available with automatic temperature control.



HIGH TEMPERATURE FURNACE

Temperature to 2600° F. Heating elements are silicon carbide rods which are easily replaced. Inside dimension 4" W. x 7" L x 3" H. 48 step Temperature control with indicating pyrometer

HEVI DUTY ELECTRIC COMPANY

LABORATORY FURNACES **MULTIPLE UNIT** ELECTRIC EXCLUSIVELY

MILWAUKEE 1, WISCONSIN

When inquiring check CP 5331 on handy form, pgs. 2-3

THE DYNACLONE

PATENTED

The **ULTIMATE** in Dust Filters



HOW IT OPERATES

- Dust laden air is drawn in from the dust sources as indicated by the shaded arrows.
- It is diffused into the dust chamber by the baffle plate.
- It is then drawn through the fabric of the filter bags and is cleaned as shown by the clear arrows.
- Clean air passes out of the case and goes to the suction fan.
- Concurrently, the traveler moves back and forth across the dust wall registering successively with one bag at a time.
- The suction which exists in the dust chamber draws a blast of atmospheric air through the bag in reverse directions and cleans that bag. (No shaking.)

Control your industrial dust better, for less — with the Sly Dynaclone. May we explain how?

SEND FOR BULLETIN NO. 102

THE W. W. SLY MANUFACTURING CO.

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Cincinnati • St. Louis • Minneapolis • Birmingham • Los Angeles • Toronto

SLY

PIONEERS & LEADERS

in INDUSTRIAL DUST CONTROL

When inquiring check CP 5332 on handy form, pgs. 2-3

FOR THE LABORATORY

(Continued from page 97)

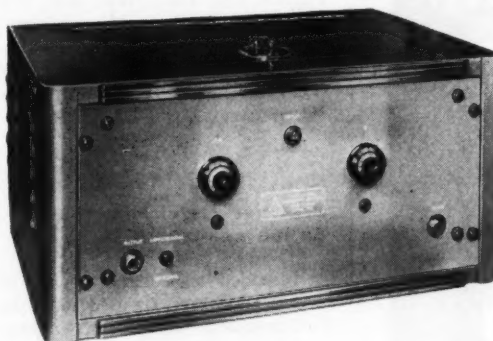
The standard Model V-4300 Spectrometer consists of a sensing probe with RF pre-amplifier, special radio-frequency transmitter and receiver, sweep unit, oscillograph, power supply, all cables and wiring, and cabinet. The required highly stable magnet system is not supplied as a part of the spectrometer, but can be obtained separately from manufacturer of the basic unit. While a recorder is often used as an accessory, a similar result may be obtained by photographing the oscillograph traces directly.

This technique can provide instantaneous control signals when the material to be processed is simply passed through a probe attached to a simplified detecting system set up for observation of the element of interest.

(Model V-4300 High Resolution n-m-r Spectrometer is manufactured by Varian Associates, Dept. CP, 611 Hansen Way, Palo Alto, Calif. . . . or for more information check CP 5333, pages 2 and 3.)

High gain-bandwidth tube used in single channel differential analyzer

Two features of particular interest have been incorporated into the Oak Ridge Single Channel Differential Analyzer. First, the circuit of the unit consists of an expander amplifier using Type 404A pentodes. This tube has a gain-bandwidth product higher than any other conventional re-



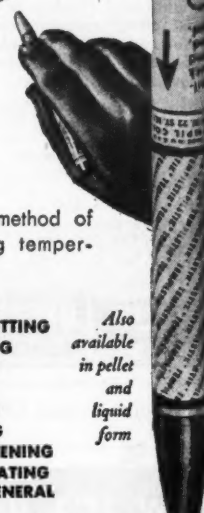
Unit incorporates two features in circuit design for greater accuracy

ceiving tube. Secondly, a 1N38A crystal diode is employed to prevent the plate voltage of the first amplifier 404A from falling more than 5 volts below its quiescent value. This limited potential swing will allow the plate to recover rapidly after a large signal.

(Single Channel Analyzer may be used in conjunction with the ORNL A1C Linear Amplifier and ORNL A1C Linear Preamplifier, all of which are products of Radiation Counter Laboratories, Inc., Dept. CP, 5122 W. Grove St., Skokie, Ill. . . . or for more information check CP 5334 on handy form, pages 2 and 3.)

Tempilstiks®

*The amazing
Crayons
that tell
temperatures*



A simple method of controlling temperatures in:

- WELDING
- FLAME-CUTTING
- TEMPERING
- FORGING
- CASTING
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Also available in pellet and liquid form

It's this simple: Select the Tempilstik® for the working temperature you want. Mark your workpiece with it. When the Tempilstik® mark melts, the specified temperature has been reached.

\$2 each
gives up to 2000 readings

Available in these temperatures (°F)

113	263	400	950	1500
125	275	450	1000	1550
138	288	500	1050	1600
150	300	550	1100	1650
163	313	600	1150	1700
175	325	650	1200	1750
188	338	700	1250	1800
200	350	750	1300	1850
213	363	800	1350	1900
225	375	850	1400	1950
238	388	900	1450	2000

FREE — Tempil® "Basic Guide to Ferrous Metallurgy" — 16½" by 21" plastic-laminated wall chart in color. Send for sample pellets, stating temperature of interest to you.

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When inquiring check CP 5335 on handy form, pgs. 2-3

CHEMICAL PROCESSING

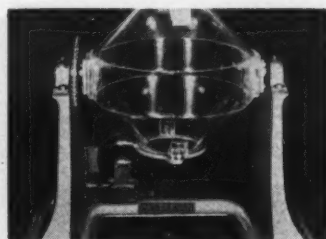
LABORATORY

Construction of blender permits observation of blending factors . . .

plastic blending compartment has capacity of 0.5 cu ft

Uses: Designed for research and development of a wide range of blending problems.

Features: Made of clear rigid plastic, unit provides the opportunity of studying: effects of changes in blending times; effects



Produces a uniform blend of dry materials. Same blend is obtained later with production-size units, and this laboratory scale blender thus gives an accurate indication of the nature of the production blend

of changes in consistency of raw materials; density differences; effects of size and shape of particles; general nature, such as adherence of particles to each other or to blender walls, particle breakage, and other factors.

Description: Unit is complete and compact with its lightweight aluminum frame and integrally-mounted motor drive. With its diameter of 12", it has a gross capacity of 0.5 cu ft and a batch or working capacity of 0.31 cu ft. It is capable of blending any materials weighing up to 100 lb per cu ft.

(The Type "LP" Conical Dry Blender is manufactured by The Patterson Foundry and Machine Co., Dept. CP, East Liverpool, Ohio . . . or for more information on this blender, reader may simply check CP 5336 on convenient Reader Service slip located between pages 2 and 3.)

For more information on product at right, specify CP 5337 . . . see information request blank between pages 2 - 3.

Whatever you process...

you can look to Blaw-Knox for Equipment that excels in Design, Construction, Performance

The Blaw-Knox Process Equipment Division is headed by a smooth-working, highly efficient group of design engineers and fabricators with outstanding records of accomplishment.

Their skills are augmented by the most modern shop facilities capable of handling any type of equipment—regardless of size or complexity. The resources of seven modern manufacturing plants in the Pittsburgh area (all a part of Blaw-Knox Company) can be drawn upon for heavy plate and structural work in steel, stainless steel, nickel and non-ferrous alloys; heat and corrosion-resistant castings; prefabricated piping, and machine work of the highest calibre.

Blaw-Knox is prepared to fabricate either standard process equipment or processing units to your own specifications . . . We are prepared to discuss any phase of our work or to quote on contemplated purchases.

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BLAW-KNOX EQUIPMENT DIVISION

Blawnox, Pa.

designs and builds equipment for: Distillation . . . Cracking . . . Gas Cleaning . . . Solvent Extraction . . . Solvent Recovery . . . Heat Transfer . . . Gas Absorption . . . Polymerizing . . . Evaporation . . . Crystallization . . . Impregnation . . . High Pressure Processing

BUFLOVAK EQUIPMENT DIVISION

Buffalo 11, New York and Mora, Minn.

produces a complete line of: Food processing equipment . . . Evaporators . . . Vulcanizers . . . Dryers—atmosphere and vacuum . . . Special Machinery in All Metals

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BLAW-KNOX COMPANY

BLAW-KNOX EQUIPMENT DIVISION
PROCESS EQUIPMENT DEPARTMENT



Pittsburgh 22
Pennsylvania

make Perchloric Acid handling safer!



Alberene Perchloric Hoods in Research Laboratory, International Nickel Company, Inc., Bayonne, New Jersey

Precautions that must be taken in handling perchloric acid make special hoods a necessity. Now Alberene Stone offers you fume hoods specially designed to reduce hazards in working with perchloric acid . . . specially designed to give you greater safety. For prompt advice on any of your fume problems write Alberene Stone Corporation of Virginia, 419 4th Ave., N. Y. 16, N. Y., or visit our nearest branch office.

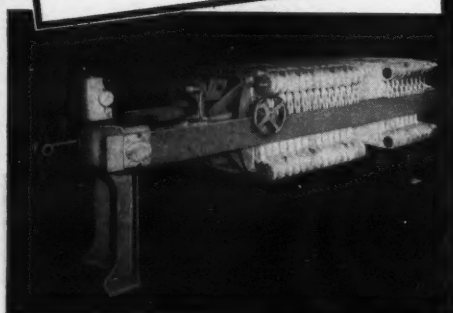
FREE REPRINTS
of an article
giving helpful hints
on safe handling
of perchloric acid
are yours for the
asking. Just write
today on your
company letterhead.



ALBERENE STONE
Branches in Principal Cities

When inquiring check CP 5338 on handy form, pgs. 2-3

4 WAYS TO USE A FILTER



- 1—Filter to Recover Solids reasonably dry, firm, easy to handle.
- 2—Filter to Clarify, Purify, Decolorize, Deodorize, etc.
- 3—Wash or Extract to recover or remove soluble contents in filter cake.
- 4—Steam, Melt or Redissolve the cake.

In a Shriver Filter Press you'll find the one processing equipment that can do any or all of these operations—at any pressure—any temperature—under practically any conditions. That's a big claim, but as hundreds of plants have already discovered—we can prove its performance. Our laboratory is always ready. Our Catalog has the evidence.

Shriver Filter Presses

T. SHRIVER & CO., Inc. 846 Hamilton St. Harrison, N. J.
Filter Presses • Filter Media • Diaphragm Pumps

When inquiring check CP 5339 on handy form, pgs. 2-3

LABORATORY

**Hefty little mixer safe
with solvents,
flammables . . .**

1/20 hp unit can be used with
lots to 50 gal if viscosity is low

Uses: Mixer is recommended for simple fluid mixing, blending, solid suspension and dispersion, and in connection with mass transfer and heat transfer studies.

Features: Unit is approved by Underwriters' Laboratory for Class I Group D and Class II Groups E, F, G, service.

Description: Mixer clamps on rim of any vessel or may be clamped to separate support. It adjusts easily to desired angle by means of universal ball joint with screw-type locking clamp. It handles low viscosity fluids in quantities up to 50 gallons and will mix lesser volumes of high-viscosity fluids. One-twentieth hp totally-enclosed motor turns shaft at constant speed of 1750 rpm. Supply power is 110 v 60 cps AC. Motor shaft is suspended on sealed ball bearings.

Third sealed ball bearing supports tube holding mixer shaft. Shafts can be changed or replaced quickly by means of chuck connecting shaft to drive tube. Tube, chuck, and shaft are available in various alloys. Unit weighs 22 lb.

(Model XP "Lightnin" totally-enclosed mixer is a product of Mixing Equipment Co., Inc., Dept. CP, 135 Mt. Read Blvd., Rochester 11, N. Y. . . or for more information reader may simply check CP 5340 on handy form located between pages 2 and 3.)

About natural gas and gasoline

Variety of articles in 30-page publication deal with laboratories and applications of laboratory equipment. Particularly interesting is description of portable gas testing absorber for measuring the natural gasoline content of natural gas. Cenco News Chats No. 78 is issued by Central Scientific Co., Dept. CP, 1700 Irving Park Rd., Chicago 13, Ill. When inquiring reader may simply specify CP 5341 on handy form, pages 2 and 3.

LOWER PROCESSING COST!



Grieve-Hendry STANDARD CABINET OVENS

Reduced heat loss; greater efficiency and lower operating costs are possible through an exclusive combination of these Grieve-Hendry features:

- ★ No metal to metal contact
- ★ Double-gasketed doors with heat trap
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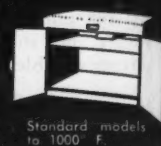
AND FIRST COST IS LOWER—MADE POSSIBLE BY SIZE STANDARDIZATION.

Specialists in precise temperatures and programmed processing. Write for literature.

DEALER INQUIRIES INVITED.

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Standard models
to 1000° F.

\$8950
and up

Immediate
delivery.

Prompt quotations
on ovens built to
your specifications.

When inquiring check CP 5342 on handy form, pgs. 2-3

First and Foremost in the FLOATLESS CONTROL FIELD



Floatless

LIQUID LEVEL and INDUSTRIAL CONTROLS

—Write for Catalog—

B/W CONTROLLER CORPORATION
2204 East Maple Road, Birmingham, Michigan

FIRST IN THE FLOATLESS CONTROL FIELD

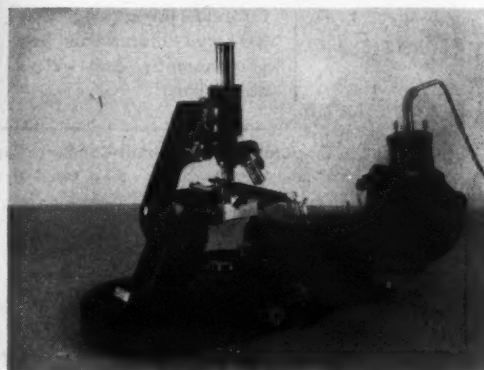
When inquiring check CP 5343 on handy form, pgs. 2-3

Unit for fluorescence microscopy combines lamp and microscope for convenience, accuracy . . .

combination of unit assures perfect alignment

Uses: Fluorescence microscopy has been employed in the following fields: chemistry, mineralogy, petrography, microbiology, and bacteriology.

Features: Design of instrument allows the ultraviolet rays to be transmitted from the lamp to the microscope entirely within the unit, so that the user is in no way disturbed by stray rays of ultraviolet or ordinary light. Unit can also be used for macro fluorescence work, and, by cutting out the ultraviolet filter, the operator may also use this instrument as an excellent source of intense light for microscopy and photomicrography with ordinary visible light without altering the position of the microscope or lamp.



Finds application in fluorescence microscopy

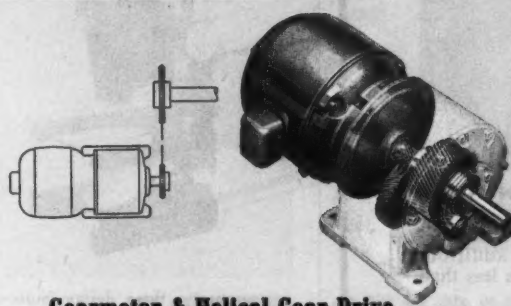
Description: The Lux UV Fluorescent Microscopy Equipment incorporates a hollow base which forms a channel for the passage of the ultraviolet rays from the lamp to the microscope. The microscope itself is attached to this base by means of a Y-shaped clamp between adjustable angle stops. The illuminating tube between the base and the lamp housing also acts as a lamp carrier. The lamp housing is spherical and provided with ventilation openings screened against the egress of light.

The filter box contains the filtering arrangements necessary for separating the ultraviolet rays from the ordinary visible light. These arrangements comprise a red filter trap and two ultraviolet filters of different density. In addition, the filter box contains a white ground glass filter which may be placed in or removed from the light path. This filter is used for subduing the light when the apparatus is used for visual microscopy with ordinary white light.

The basic unit offered consists of all necessary equipment with the exception of the mercury vapor arc lamp, connection accessories, or microscope.

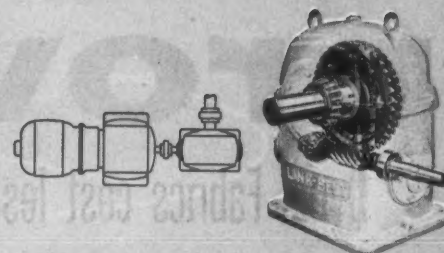
(Distributed by William J. Hacker & Co., Inc., Dept. CP, 82 Beaver St., New York 5, N. Y. . . or check CP 5344 on handy form, pages 2 and 3.)

LINK-BELT makes even your most complex speed reduction jobs simple



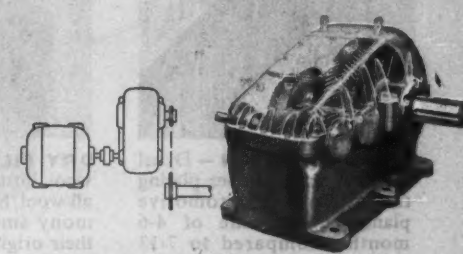
Gearmotor & Helical Gear Drive

GEARMOTOR is shown with roller chain drive. Link-Belt Helical Gear Drives, Gearmotors and Motogears are available in 6.2:1 to 292:1 reduction ratios — 1 to 30 hp — 6 to 280 output shaft rpm. Ask for Books 2247 and 2451.



Worm Gear Drive

WORM GEAR and P.I.V. variable speed drives are shown direct-coupled. Link-Belt worm gear drives are available in 3.1:1 to 8000:1 reduction ratios — 1400 to 123,000 in. lbs. torque — 0.22 to 564 output shaft rpm. Ask for Book 2324A.



Herringbone Gear Drive

HERRINGBONE GEAR DRIVE is shown connected by flexible coupling to motor and with roller chain takeoff. Link-Belt Herringbone Gear Drives are available in 2.84:1 to 326:1 ratios — 0.4 to 2480 hp — 2.2 to 623 output shaft rpm. Ask for Book 2519.

Get the proper drive combination that best meets your overall requirements from a broad line

ONLY Link-Belt can offer you such a broad selection of helical, herringbone and worm gear drives . . . plus the pre-engineered correlation of all its other power transmission equipment. This exclusive combination not only simplifies even the most complex problem — it actually cuts your costs. Here's how:

(1) *You save on installation.* Dimensions of all components — chains, sprockets, couplings, bearings — are correlated with the reducer's. There's no alignment problem . . . no need to exchange drawings with other suppliers.

(2) *You save on operating costs.* Power consumption is lower because overall efficiency is

assured. And maintenance costs go down when you rely on quality-built Link-Belt equipment.

Let a Link-Belt representative help you figure the best combination for your speed reduction requirements. You'll find it pays to make the nearby Link-Belt sales office or distributor your power transmission headquarters.

LINK-BELT
ENCLOSED GEAR DRIVES

19,128

LINK-BELT COMPANY: Plants: Chicago, Indianapolis, Philadelphia, Colmar, Pa., Atlanta, Houston, Minneapolis, San Francisco, Los Angeles, Seattle, Toronto, Springs (South Africa), Sydney (Australia). Sales Offices, Factory Branch Stores and Distributors in Principal Cities.

When inquiring check CP 5345 on handy form, pgs. 2-3

Typical Wet and Dry Filtrations prove

Dynel Fabrics cost less to use...



WET FILTRATION — Dynel diaphragms in copper plating tank (shown in automotive plant) have use-life of 4-6 months, compared to 7-13 weeks of previous filter cloths.



DRY FILTRATION — Dynel-wool dust fume bags outlast all-wool bags 9 to 1 in anti-mony smelter. In addition, their original cost is less than that of other bags.

During a 60-day actual-use test, Dynel filter cloths required only about 1/5 as many replacements as comparable cotton filter cloths under similar conditions. This reduced cloth costs by 75.4%. Fabrics were tested on a 36-inch Shriver plate-and-frame press, used for filtering various ore slurries. Total usage was 93 cotton cloths, 11 Dynel. Of the 93 cottons, most rotted because of acid disintegration. No such failures resulted during use of Dynel. Also, Dynel cloths did not become stiff with use, nor did the filter cakes adhere as tightly to them as to the cotton cloths.

... Only Dynel Filter Fabrics give you all these advantages:

- **Unaffected by most chemicals**
- **Won't shrink or stretch**
- **High strength—wet or dry**
- **Mildewproof—fungus-proof**

Investigate Dynel today! For a list of manufacturers so you can test Dynel filter cloth under the specific conditions in your plant, please write us on your company letterhead. Address:

Textile Fibers Dept. P-1, Carbide and Carbon Chemicals Company
A Division of Union Carbide and Carbon Corp., 30 E. 42nd Street, New York 17, N. Y.

Performance will tell...it's DYNEL!

When inquiring check CP 5346 on handy form, pgs. 2-3

Supervised Test proves
Dynel Filter Cloths
last 8 times longer,
cost 75% less
than cotton...

20-hour Immersion Tests demonstrate Dynel's chemical resistance

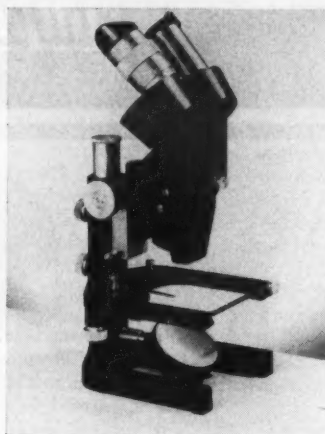
Tests made on 57 different chemicals, including acids, bases, oxidizing agents and solvents — after 20-hr. immersion periods are summarized in a handy leaflet. Write for your copy.

LABORATORY

Permits greater versatility, convenience, speed in stereomicroscopy

Uses: May be used in transmitted light or for bright field and dark field work.

Features: Incorporates three design improvements — 180° rotating binocular head, a three-way stand and a quick-change nosepiece.



Incorporates three design improvements in stereomicroscopy

Description: The Galileo DPG Stereoscopic Microscope utilizes a rotating binocular head, inclined at a comfortable 30° angle.

When completely set up, stand sits extra low to give greater comfort and convenience to user. Large specimens can be observed in this arrangement as the unit will accept objects up to 11 cm in height. Since column of the unit retracts into the base, these changes are made quickly and simply by extending or lowering the column. For close-up inspection of specimens, base support is removed by unscrewing two knobs and unit placed directly on the object to be examined.

Simple pressure of the fingers on the nosepieces permits the observer to switch instantly from one objective to another and cover magnifications from 6 to 126X quickly and easily.

(Distributed by Opplum Co., Inc., Dept. CP, 352 Fourth Ave., New York 10, N.Y. . . . or for more information check CP 5347 on handy form, pages 2 and 3.)

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INCO-CAST FITTINGS

Monel®, Nickel and Inconel®



1. Resist most corrosives

2. Strong . . . tough . . . sound

3. Withstand high and sub-zero temperatures

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WRITE

for price list catalog. Contains full information. Sent you promptly, and without obligation.

The International Nickel Company, Inc.
67 Wall Street New York 5, N. Y.

When inquiring check CP 5348 on handy form, pgs. 2-3

all new!

THROUGH AND THROUGH

NEW DESIGN

Stainless Steel Meter



ACCURATELY MEASURES LIQUIDS FOR FOODS, PHARMACEUTICALS, CHEMICALS AND CORROSIVE LIQUORS

Rockwell Rotocycle Stainless Steel Industrial Meter, Type 28C

Now you can have positive metered accounting for corrosive liquids that previously could not be handled by ordinary meters. Type 28C Rockwell Rotocycles are made of stainless steel, inside and out. They are lasting, accurate, easy to clean. Install them with certainty for batch mixing formulas, for inventory control, for cost and tax record accounting. Quantity Control Registers and Remote Registration Systems are available. Described in bulletin OG-403. Write Rockwell Mfg. Co. Dept. A-6, Pittsburgh 8, Pa.



You Can RELY ON ROCKWELL INDUSTRIAL METERS

When inquiring check CP 5349 on handy form, pgs. 2-3

CHEMICAL PROCESSING

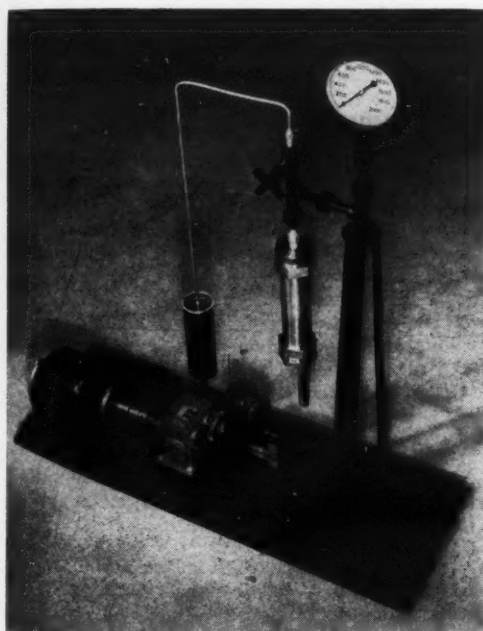
Can measure viscosity of heavy grease . . .

meets ASTM specifications, permits varying shear rates and temperatures for testing

Uses: Instrument is suitable for performing ASTM test for "apparent viscosity of lubricating greases" (D-1092). Viscometer also meets similar Federal and Armed Forces grease viscometer specifications. It can be used for tests involving viscosity of greases under varying shear rates and temperatures.

Features: Three grease chambers and eight capillaries comprising the viscometer are machined to better than ASTM requirements.

Description: Grease chambers contain piston, 2 caps, and a union for connecting to one end cap. Chambers are tested for 3000 psi. Test gages have

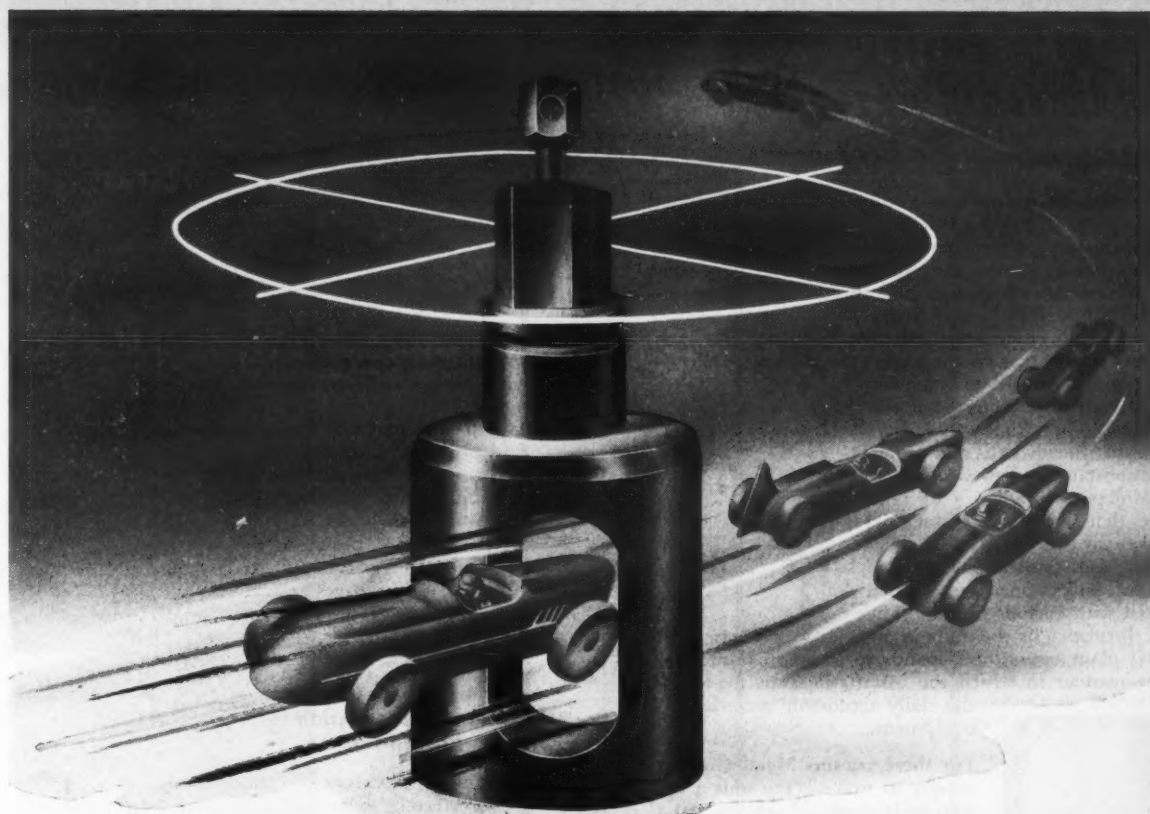


Driven by 1/4 hp motor through 200:1 speed reducer

ranges of 0-50/100/500/2000 psi. Each gage is also fitted with a union for quick connection to hydraulic system.

Eight interchangeable capillaries are used. These have 40:1 ratio of lengths to radius. Capillaries are made of seamless stainless steel with copper gaskets. Unit is driven by 1/4 hp motor through a 200:1 speed reducer. Oil strainer system is used to recirculate and clean hydraulic oil used in test. Needle valve in hydraulic oil return line allows bleeding hydraulic system of air prior to test.

(Grease pressure viscometer is a product of Technical Equipment Co., Dept. CP, 743 Dwight Way, Berkeley 10, Calif. . . . or for more information reader may simply check CP 5350 on handy form, pages 2 and 3.)



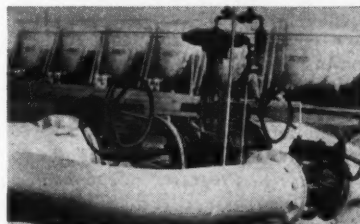
SPLIT-SECOND RESPONSE

In valve operation, too, fast action can often be of critical importance. Q.C.F.'s CYLINDRICAL Plug has a quick quarter-turn shut-off for safe control . . . full pipe area for capacity flow . . . a non-wedging effect for trouble-free performance.

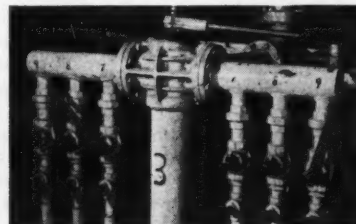
Because of this outstanding combination of

features, Q.C.F. CYLINDRICAL Lubricated Plug Valves are safely and efficiently handling gasoline, oil, air, gas, vacuum, acids, caustic solutions, chemicals and many other fluids.

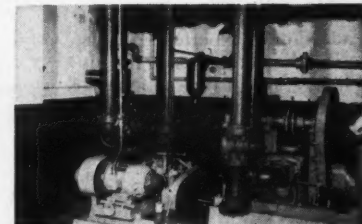
Sealed-in lubricants cut maintenance, help insure top service at minimum cost. Specify Q.C.F. Valves and be sure.



In the Petroleum Industry the full pipe area of the Cylindrical Plug provides capacity flow.



On Natural Gas in Steel Plants, quick shut-off and 'turn on' provides positive and immediate control of flow.



In Sewage Plants, the Q.C.F. Cylindrical Plug shears obstructions, keeps sludge lines open.

Q.C.F.



PLUG VALVES

Write for Catalog 4-CP. American Car and Foundry Company, Valve Division, 1501 E. Ferry Ave., Detroit 11, Michigan.

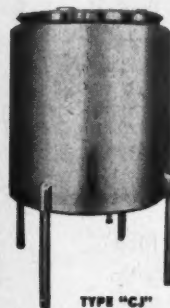
Representatives in 50 Principal Cities

When inquiring check CP 5351 on handy form, pgs. 2-3

What's eating your stainless steel tanks?

For more than a quarter century Metal Glass Products Company of Belding, Michigan has specialized in the manufacture of stainless steel tanks for all phases of the processing industries. In that time they have come to know the advantages and limitations of stainless steel fabrications for industry.

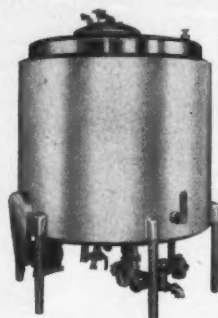
The design engineers at Metal Glass realize that stainless steel is not the cure-all to corrosion and wear that many believe it to be. They know that there are many acids, salts and organic substances that will attack stainless steel tanks. They realize that special care must be taken in every step of installation and fabrication to keep their tanks unaffected when used with various liquids. The performance of the units in actual plant operation depends to a large extent upon the manner in which the installation was made and the daily treatment accorded the equipment.



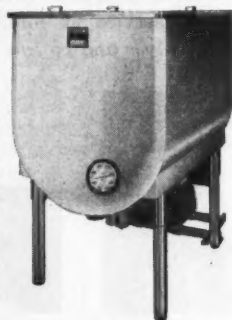
TYPE "CJ"

For these reasons Metal Glass attempts to make every unit a custom built model. Even the standard items illustrated in this article are precision built. Despite the care exercised in building standard units, there are many applications that call for a specially designed piece of equipment. It is in cases like these that it pays to call on Metal Glass. Our engineers working with your personnel can develop a tank to meet your exact requirements. Our engineering department is set up and maintained to help you on your special tank problems. We welcome the opportunity to work with you.

In addition to experience in the specific characteristics of metals with reference to corrosion resistance, heat transfer and general machinability, we can offer you considerable knowledge in insulating materials, types of refrigerants and metalizing processes.



TYPE "CK"



TYPE "CHR"

Write us today for assistance or consultation on your problem.

STAINLESS STEEL SAN-I-TANKS

METAL GLASS PRODUCTS COMPANY

BELDING 11, MICHIGAN

DISTRICT OFFICES: New York • Chicago • Atlanta • Detroit
Pittsburg • Pasadena • Toronto

When inquiring check CP 5352 on handy form, pgs. 2-3

Briefs . . . from contemporary publications

Here's a quick look at interesting articles appearing in other publications . . . as selected by the editorial staff of CHEMICAL PROCESSING

Minimizing corrosion in petroleum refineries

Directed to processors of petroleum, this paper covers the corrosion of polycharge preheaters, crude fractionating tower tops, amine gas plant reboiler tubes, Linde gasoline treater eductors, and gasoline condenser equipment under the headings of problem, materials, and process conditions. Practical suggestions for minimizing corrosion are given. Four pages, 1 table. ("Petroleum Processing," September 1953, page 1332)

Ammonia production from gas and air

Author concentrates on catalysts and catalyst performance in second article of series on production of ammonia from natural or refinery gas and air. Reaction, methods and yields are given. Large flowsheet is included. Two pages, two photos, one diagram. ("Petroleum Engineer," September 1953)

Fundamental study of agitation of viscous suspensions

For agitation of solids suspended in liquids in tanks up to 18" in diameter, the power requirement of flat paddles is not influenced by wall baffles. Such agitation is markedly related to characteristic flow patterns and time required to reach a condition of steady state. Through application of the principles of geometrical similarity and equal power per unit volume of slurry, small but true models were successfully scaled up over a three-fold range. Eight pages, 7 tables, 6 figures. ("Chemical Engineering Progress," September 1953, page 459)

Cast iron pipe coatings

Principal purpose of this paper is to relate what has happened to coal tar coatings inside water systems. Information on how such corrosion is thought to occur is given. Photographs illustrate how a natural coating may form to protect pipe for as long as 100 years. 25 pages, 21 photos. ("Journal American Water Works Ass'n," August 1953, page 807.)

Discuss stress and strain at crazing of polymethyl methacrylate

Results of stress and strain measurements at the onset of crazing of polymethyl methacrylate made at 23, 50 and 70°C are discussed in relation to a "critical-strain theory" for the threshold of crazing as suggested for polystyrene. Authors discuss materials tested, test equipment and procedure, and results of tests. 6 pages, 6 figures, 2 tables. ("ASTM Bulletin," July '53, page 65)

Improved transparent plastics

Thermoplastic materials have been added to polyesters that are primarily thermosetting to achieve a plastic that permits forming in the "B" stage of polymerization. Such transparent polyesters exhibit noncrazing tendencies and high impact values. Comparisons with acrylics on the bases of specific gravity, tensile strength, heat distortion, impact strength, hardness, flexural modulus, and formability are made. Four pages, 2 tables, 1 figure, 5 photographs. ("Modern Plastics," October 1953, page 107)

Results from pulp mill using black liquor oxidation

Experience and data obtained from operation of a Norwegian black liquor oxidation plant are presented. Author reports greatly increased production of recovery system, lower fuel consumption, less sulfur loss and re-burned lime demand, reduced corrosion, low maintenance, and simple operation. 3 pages, 5 figures. ("Paper Trade Journal," September 4, 1953, page 14)

Paper products as thermal insulators and sound absorbers

The Forest Products Laboratories have successfully foamed phenolic resin in honeycombed paper cores to achieve an insulating material with a thermal conductivity that approaches that of common insulators. Sandwich panels with various arrangements of corrugated cores exhibit good sound-absorbing properties. Four pages, 3 tables, 1 figure, 3 photographs. ("Paper Industry," September 1953, page 658)

Infrared heating used for continuous processes

Fast, clean infrared heating permits improved control of operation and eliminates overbaking when conveyor systems fail. Infrared ovens compare with fuel-fired ovens in first, operating, and maintenance costs and make possible finished products of higher quality. Various infrared generators are contrasted. Five pages, 5 figures, 2 photographs. ("Iron Age," Oct. 1, 1953, p. 97)

Polymerization through irradiation

Experiments performed at the Brookhaven National Laboratory deal with bulk polymerization initiated by nuclear radiation. Data show the possibility of making polyfluoropropylene, polyfluorobutadiene, and polyfluoroacrylonitrile, though with low yields. Three pages, 1 figure, 1 table. ("Nucleonics," October 1953, page 18)

The heat pump — after ten years

In an informative survey of the heat pump, Sporn and Ambrose cover the market, heat pump cycle, residential and commercial units, heat sources, installation and research. Improvements in cycle, assembly, design, and operating efficiency are presented. Ten pages, 3 tables, 5 figures, 7 photos. ("Heating and Ventilating," Sept. '53, page 88)

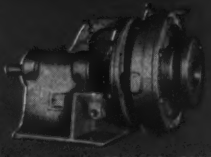


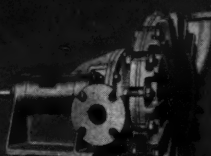

Beryllium copper as a corrosion resistor

An informative survey of the degree to which beryllium copper resists corrosion by liquid metals, acids, alkalis, fresh and salt waters, carbon dioxide, and the halogens. Effects of temperature, stress corrosion cracking, fatigue, and cavitation-erosion are discussed as is the position of beryllium copper in the production of nonsparking tools. Thirteen pages, 18 tables, 15 figures, 50 references. ("Corrosion," Oct. 1953, page 359)

Air purification cuts costs

In air conditioning, the use of outside air to reduce odor and stuffiness requires increased sizes of ducts, boilers, and refrigerating equipment. Air pollution and health, methods of removing pollutants, and savings in equipment by purification of air are discussed. Four practical systems for attaining comfortable conditions are compared. Six pages, 3 tables, references. ("Refrigerating Engineering," September 1953, page 959)

Find the Best Pump for Your Process Job Here—

	TYPE	APPLICATION	SIZE RANGE	SPECIAL FEATURES
	SSB Single suction Frame mounted Grease lubricated Also available close-coupled	General purpose use	Heads to 550 feet. Capacities to 3500 gpm. Temperatures to 250 F.	Available in many materials. Choice of packing, single or double mechanical seal. Bearings protected from corrosive or abrasive atmosphere.
	SSB Single suction Frame mounted Oil lubricated	Chemical, petroleum and general purpose use in medium high temperature range	Heads to 550 feet. Capacities to 3500 gpm. Temperatures to 550 F.	Available in many materials. Choice of packing, single or double mechanical seal. Stuffing box cooled above 250 F.
	Refinery Type R Single suction Frame mounted Oil lubricated	Volatile liquids and high temperature process applications requiring heavy duty refinery type pump	Heads to 600 feet. Capacities to 1300 gpm. Temperature to 800 F.	Available in many materials. Choice of packing, single or double seals. Stuffing box, bearings, and pedestal may be water cooled.
	P and PD Single suction Frame mounted Grease lubricated	Handling fine abrasives in suspension or corrosive liquids	Heads to 260 feet. Capacities to 1300 gpm. Temperatures to 250 F.	Stuffing box on suction side. Choose packing, mechanical seal or Equiseal stuffing box — stops leakage to 15 feet suction head. Open or closed impeller.
	PW — CW Single suction Frame mounted Grease lubricated	Handling slurries and pulps which combine corrosive liquid with suspended solids	Heads to 270 feet. Capacities to 10,000 gpm. Temperatures to 250 F.	Available in many materials. Choice of packing or mechanical seal. Easy to disassemble for inspection or repair.

Complete Pumping Unit with Undivided Responsibility

HERE'S what you can get from Allis-Chalmers: Complete pumping unit — pump, drive, motor and control — ready to install and run. You save installation time. All parts are of coordinated design... built to run together. You get one dependable guarantee of satisfaction for complete installation.

Equiseal is an Allis-Chalmers trademark.

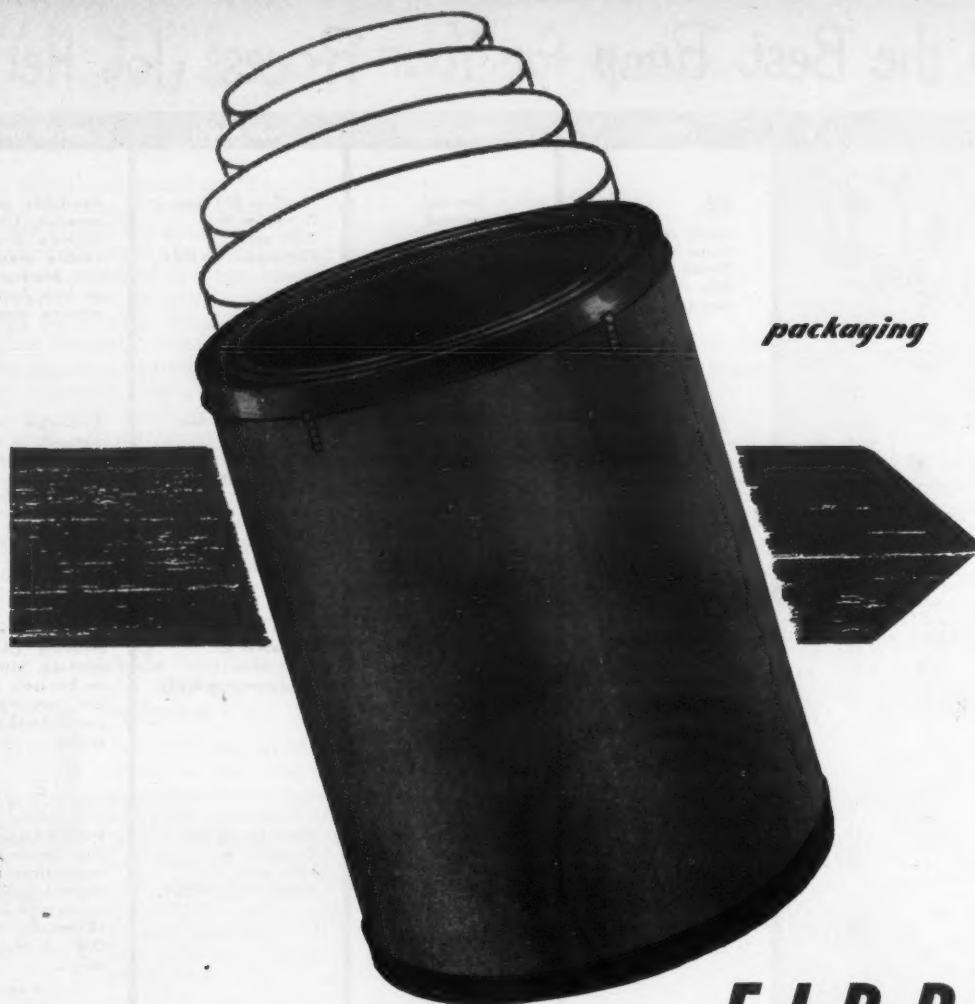
Your nearby Allis-Chalmers District Office representative will be glad to help you with your process pumping problems. Or for complete information on Allis-Chalmers pumps for the chemical industry, write for the bulletins indicated in the table above.

Allis-Chalmers, Milwaukee 1, Wis.

ALLIS-CHALMERS



When inquiring check CP 5353 on handy form, pgs. 2-3



The major consumer of fibre drums is the chemical industry, which has adopted fibre drums as container for thousands of dry products. Today about two out of every three fibre drums manufactured by one large company are used for shipping some chemical or allied product — molding powder to gun powder, dyestuffs to detergents, insecticides to pharmaceuticals.

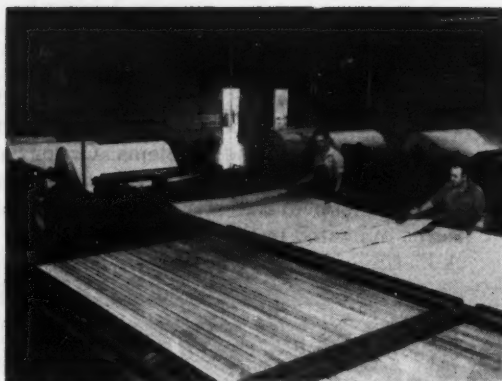
To the producer of dry chemicals, the fibre drum offers many advantages as a container for storage and shipment. Not the least among these is the light tare weight of the drum. This becomes more important as transportation costs climb, and can constitute a considerable savings on export shipments to countries charging import duty on gross weight.

Convenience in handling is another advantage. Most fibre drums are equipped with simple, positive locking devices which require no special skill to operate. In addition, they provide a wide choice of sizes and construction strengths. Drum sizes range from $\frac{3}{4}$ to 75 gal in capacity for packing weights of 30 to 400 lb. There is a fibre drum for almost every unit weight.

Sanitary interiors plus durability are two important factors when packaging fine chemicals, expensive drugs, and other sensitive products requiring protection from contamination and loss from breakage. Fibre drums include both these features, and

FIBRE DRUMS

Versatile Packages for a Growing Industry



Sheets of linerboard are cut into appropriate size for convolute winding



Tubes are formed on this convolute winder, and are then cut to desired size on slitter



Stamping press turns out metal covers for fibre drums. This represents but one type of closure



Operator is completing bottom assembly by addition of bottom chime band. Chime construction is such that abusive drops actually tighten bottom assembly. Following this operation, drums are processed for nesting and shipment

in particular are said to have an enviable shipping record at home and abroad. Much of their strength comes from the resilient constructions that absorb shocks and strains by flexing instead of breaking.

A final advantage is the special treatment that can be given the drums in supplemental finishing. A wide assortment of linings, coatings, impregnations, and barriers can be readily built into the drum construction depending on customer requirements. When the product to be packed is chemically reactive, linings of polyethylene, pliofilm, vinyls, aluminum foil, cellulose acetate, parchment, glassine, and others are available — fabricated as an integral part of the drum. Microcrystalline wax and various synthetic resin coatings are available — applied to the interior of the drum after fabrication. Impregnations of such materials as paraffin and silicate of soda can also be made.

When protection from moisture is all that is required, a barrier of asphalt duplex is most commonly used, wound as one ply of the drum side.

(Continued on next page)



Operator is welding top and bottom chimes. Finished chimes can be seen at right, rear

A MAJOR USER OF MULTIWALL BAGS ANSWERS A CANDID QUESTION



QUESTION:

"How have you used Multiwall Bags in your merchandising program?"

User: **DRAGON CEMENT CO., Inc., New York, N. Y.**

"THE PRINTING SURFACE ON OUR MULTIWALL BAG GIVES US AN ADVERTISING BILLBOARD"

The distinctive Dragon design identifies seven major products manufactured by this well-known company in the cement industry.

The familiar design which establishes the family relationship among Dragon products was developed by Dragon Cement personnel in cooperation with the Union Bag Art Department.

Good design, good printing, and a uniformly good printing surface make Union Multiwall Bags an extra advertising medium for your product as well as an economical container.

MORE SO EVERY DAY, IT'S



UNION *for* MULTIWALLS

UNION BAG & PAPER CORPORATION • WOOLWORTH BUILDING, NEW YORK 7, N. Y.

When inquiring check CP 5354 on handy form, pgs. 2-3

NEW

hydrogen transport solves refiners' storage problems



Semi-trailer Mounts 30 or 38 Tubes for Mobile, Compact, High Pressure Hydrogen Storage

In response to hydrogen storage problems faced by new platforming process plants, Taylor-Wharton offers two kinds of high pressure cylinder installations, the permanent and the transport, now successfully used in the chemical industry.

Investigation of high pressure equipment will reveal the economy of this method of storage. (Low pressure storage requires an expensive compressor.) The tubes readily provide a flexible supply of hydrogen to get you "on stream" quickly. High pressure storage saves space, packing up to 50,000 cubic feet of hydrogen at 2400 psi in the transport.

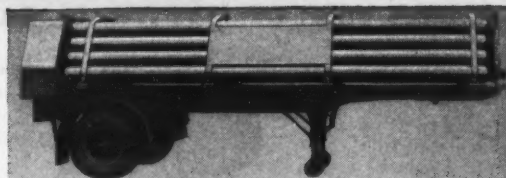
Write now for Bulletin 200 which will show you the economy of Taylor-Wharton cylinders for your hydrogen plant.

TAYLOR-WHARTON IRON & STEEL COMPANY

CINCINNATI 12, OHIO

Also Manufacturers of: Manganese Steel Castings, Alloy and Carbon Steel Castings, Special Trackwork, Gas Cylinders

When inquiring check CP 5355 on handy form, pgs. 2-3



Semi-trailer with 30 or 38 tubes is delivered to point of usage. Capacity of 30 tube unit is 39,000 cu. ft. at 2400 psi; of 38 tube unit, 50,000 cu. ft. at 2400 psi.



Taylor-Wharton can also furnish individual storage cylinders, made to ICC 3A2400 classification and qualifying under API-ASME for 1450 psi.

Taylor-Wharton high pressure transports efficiently store and deliver for Allied Chemical & Dye Corporation. High storage capacity and mobility will save handling dollars and floor storage space for you too.



Modern heat treating facilities for tubes at Taylor-Wharton Iron and Steel Company.



PACKAGING

(Continued from preceding page)



Bottom discs (fabricated on another line)

wall from kraft duplex laminated asphalt. For products extremely sensitive to moisture pick-up, protection is provided by incorporating a ply of special resin laminated triplex, the center ply being of aluminum foil.

Thus have technological advances in the chemical industry been quickly utilized by the fibre drum industry. New treatments open new markets for fibre drums. Ultimately the major use may be extended beyond dry powders to semi-liquids and even pure liquids. Research toward this end is under way, and so this relatively new but rapidly expanding industry may be looked to to produce even more versatile packages.

(Material and photographs for this article courtesy of Continental Can Company, Dept. CP, 100 E. 42nd St., New York 17, N. Y. . . . or for more information check CP 5356, pages 2 and 3.)

Acetylsalicylic acid shipments protected by plastic liners in fiber drums

Better protection of quality of acetylsalicylic acid may be maintained by aspirin tablet manufacturers because of plastic liners used for packaging the product, a large chemical company has announced.

To maintain proper packaging conditions, all company's acetylsalicylic acid crystals are packaged in polyethylene liners placed in fiber drums. Acetylsalicylic acid granulations with starch are packaged in Saran liners placed in fiber drums. Because starch used in acid granulations is hygroscopic, a liner providing a good moisture barrier is essential. Storage in Saran liners over long periods is said to have shown no appreciable change in free salicylic acid content.

(Information courtesy of The Dow Chemical Co., Midland, Mich.)

For more information on product advertised at right, specify CP 5357 . . . see information request blank between pages 2 and 3.

PLANTS
NEWARK
MELBOURNE

Sell as you Ship with **RHEEMCOTE** drums

The only large steel containers
with all these
extra points of value!



- Any design, including halftones, lithographed in as many colors as you want.
- Entire surface of drum can be used for your selling design.
- Family identification can now be achieved by using same design on all containers, large or small.
- Tough, high-gloss finish is baked on for durable, handsome appearance.
- Interior can be coated with special protective lacquers.
- Electric resistance-welded seam is smooth and clean.

Use this powerful new advertising medium. For more information, write

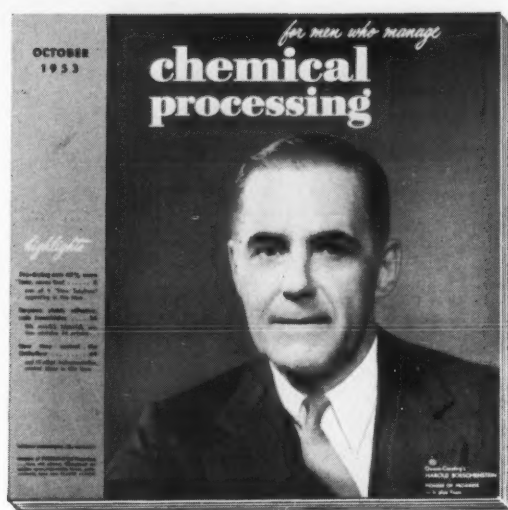
RHEEM

MANUFACTURING COMPANY

General Sales Offices • 570 Lexington Avenue, New York 22, N.Y.

RHEEM MANUFACTURING COMPANY • Manufacturing Plants in 22 Cities Around the World

PLANTS AND OFFICES: BURLINGTON, LINDEN, NEW JERSEY • CHICAGO, ILL. • HOUSTON, TEXAS • NEW ORLEANS, LA. • NEW YORK, N. Y.
NEWARK, RICHMOND, SAN FRANCISCO, SAN PABLO, SOUTH GATE, CALIF. • SPARROWS POINT, MD. • FOREIGN PLANTS: BRISBANE, FREMANTLE,
MELBOURNE, SYDNEY, AUSTRALIA • BRISTOL, UNITED KINGDOM • BUENOS AIRES, ARGENTINA • HAMILTON, ONTARIO • LIMA, PERU
RIO DE JANEIRO, BRAZIL • MILAN, ITALY • SINGAPORE



Have you wondered

← why this magazine

comes to you

...without charge?

MAYBE, LIKE MANY others, you've always thought that all publishers make their money, or much of it, from the subscriptions they sell.

'Tisn't so . . .

. . . no, 'tisn't so. With the exception of a few general magazines (e.g. *READER'S DIGEST*) that sell hundreds of thousands — some millions of copies — most industrial publishers with relatively small circulations actually lose money on their subscription sales.

Then how do industrial publishers make money? As you can guess, they make it from the advertising they sell. *Total subscription sales are hardly a "drop in the bucket" compared to advertising revenue.*

Advertisers demand best coverage

Since advertisers pay the bills, they demand best possible coverage of all important men in the field. So it's up to the publisher to publish the most readable magazine possible . . . then to insure coverage of the maximum number of the best readers.

You can't do that by selling subscriptions — sales costs are high — a large share of the subscribers cancel each year — and no matter how much time, money, and pressure is used

there are always some of the important men who will never buy.

As you can see, the most effective method of getting the kind of coverage advertisers want is (a) to hand-pick the most important men; (b) send the magazine to *ALL* these men; and (c) to make the magazine so interesting, so valuable that they will want to read it.

That's why . . .

. . . *Chemical Processing* is sent only to qualified readers . . . selected management and technical key-men in the chemical industry; that's why you get *Chemical Processing* free — that's why we spend thousands of dollars on each issue to make it worth your time to read it. For you are an important reader in the chemical processing field.

Chemical Processing

Published by Putman Publishing Company

Creators of PUTMAN-STYLE Magazines

. . . terse, vital editorial; "hand-picked" circulation; square, high-visibility format; quality readership; hence more **READER ACTION**



Richard
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to im
speed.
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equip
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No. 0

When
DECE

IF WEIGHING, BLENDING OR
PROPORTIONING MATERIALS
IS IMPORTANT TO YOU . . .

THIS

NEW GUIDE

IS

MUST

READING

Richardson's new guide to automatic weighing, blending or proportioning of materials points out *new methods-new equipment applications* in these important processes. Simply find your material in the index, refer to the equipment section and you're on your way to improving your present operations through increased speed, economy and accuracy.

Let Richardson's 50 years of experience in building Automatic Weighing, Proportioning and Blending, equipment help you discover new and improved methods in your field—no matter what you handle.

Write today for your free copy of this guide Bulletin No. 0450.

RICHARDSON SCALE COMPANY

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Montreal • New York • Omaha
Philadelphia • Pittsburgh • San Francisco
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Richardson

7489

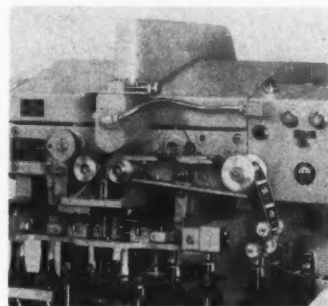
MATERIALS HANDLING BY WEIGHT SINCE 1902

PACKAGING

**Printed cellulose bands
applied to bottles
automatically . . .**

bottle spotting mechanism and
electric eye assure register

Incorporation of an electric eye in automatic cellulose banding machine makes it suitable for use with printed bands. Another feature available with unit is a bottle spot-



Handles 65 eight-oz bottles/min

ting mechanism which assures printed bands being accurately located on bottle in relation to regular labels.

Changeover from a printed band to a plain band is accomplished by merely pressing a button. These refinements are said to make machine universal in application. With this equipment, any container that is normally fed through automatic cappers, fillers, or labelers may be automatically banded at packaging line speeds.

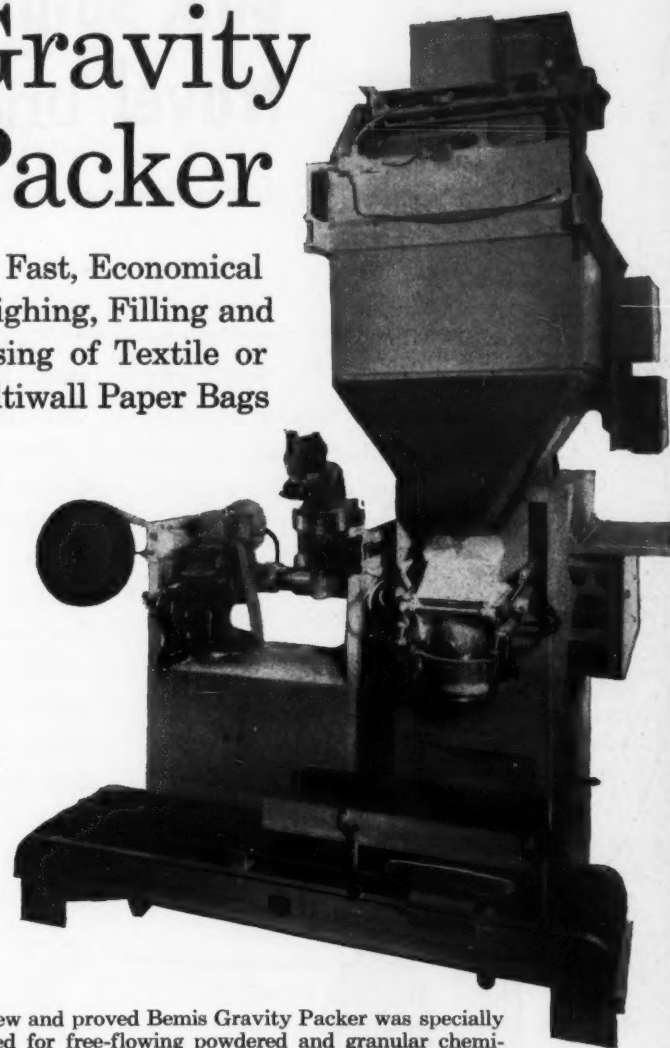
One large manufacturer has reported that the banding unit in his plant handles 8-ounce Boston round bottles with 26 mm caps at speeds to 65 units per min. Previous to installation of machine, 4 to 5 people had been employed in applying seals by hand. Accompanying costs and fluctuation of production had necessitated consideration of another type seal. Satisfactory results with banding machine have been reported by user over a nine month period.

(World Automatic Banding Machine is a product of Economic Machinery Co., Dept. CP, 60 Fremont St., Worcester 3, Mass. . . or for more information on manufacturer's product, reader may simply check CP 5359 on handy Reader Service slip located between pages 2 and 3.)

It belongs in your Packing Room

Bemis Gravity Packer

For Fast, Economical
Weighing, Filling and
Closing of Textile or
Multiwall Paper Bags



This new and proved Bemis Gravity Packer was specially designed for free-flowing powdered and granular chemicals. Handles 50-lbs. to 100-lbs. One- or two-man operation. Speeds—up to twelve bags per minute are normal. Actual production records of many concerns show a much higher out-put on this machinery. Ask your Bemis Man for the complete story.

Bemis



Packaging Service
305 — 27th Avenue Northeast
Minneapolis, Minnesota

When inquiring check CP 5360 on handy form, pgs. 2-3

When inquiring check CP 5358 on handy form, pgs. 2-3

DECEMBER, 1953

111



Bulk shipments can travel bright and light

IN CONTINENTAL LEVERPAK DRUMS

There's no reason in the world why your bulk shipments shouldn't look as attractive as any other packages in your line. Not when you can purchase Leverpak fibre drums!

As part of Continental's Tailor-Made Package Service, we make these drums in 17 eye-catching colors. We reproduce names and trademarks in any of 14 different inks.

But good looks is only part of the

story. Leverpak drums are capable of carrying up to 40 times their own weight — their resiliency lets them shrug off bumps or falls and handling abuse. They load compactly and ride safely. The patented locking device is easy to open, easy to close. Metal chimes are flash butt welded for greater strength.

Why not ask our nearest sales office what Leverpak and other Continental drums can do for you. We'll be glad to hear from you at your convenience.



CONTINENTAL CAN COMPANY

FIBRE DRUM DIVISION
VAN WERT, OHIO



New York • Philadelphia • Pittsburgh • Tonawanda • Cleveland • Chicago
Atlanta • St. Louis • San Francisco • Los Angeles • Eau Claire

When inquiring check CP 5361 on handy form, pgs. 2-3



PACKAGING

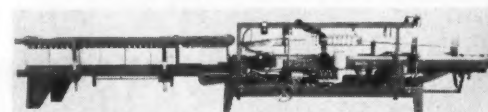
Flap hold-down time reduced, no messy glue pots on case sealer . . .

pre-heated flaps facilitate glue setting, making unit length shorter

Uses: For case sealing applications.

Features: Length of unit has been reduced by method of pre-heating outside flaps before glue is applied, which necessarily reduces length of hold-down time since glue sets faster. To eliminate mess often caused by glue, unit has totally enclosed glue system.

Description: Gluer and compression components of units are operated by one $\frac{3}{4}$ hp gear head motor. Frame is welded and bolted steel. Electric strip heaters are used for drying glue. Overall



Gluer (right) and compression component (left) are operated by one motor

length of Model F gluer component is 11 ft. Standard compression component is 6 ft in length. Compression unit length may be increased by addition of 2 ft components. Standard overall unit will handle six No. 2 cases per min, and up to 20 per min with compression components.

(Case sealer is a product of Chisholm-Ryder Co. of Pa., Dept. CP, Hanover, Pa. . . . or check CP 5362 on handy form, pages 2 and 3.)

Three booklets will help men doing packaging

Numbers 41, 42, and 43 of Packaging Series consists of papers selected from those presented at the April 1953 Packaging Conference of the American Management Association. Number 41 (56 pages) covers organization of a packaging system, writing of packaging specifications, use of filling equipment, processing of orders, packaging for self-service goods, and reduction of distribution costs through packaging.

Number 42 (56 pages) covers recent advances in plastic films and adhesives, printing production, label design, and production of folding boxes. Number 43 (27 pages) deals with practical problems in packing and handling, and carries papers on reduction of product damage in shipping, a material handling research program, packaging of odd-shaped parts, and measurement of material handling truck performance.

Any one booklet can be obtained by remitting \$1.25 (non-member AMA) or \$1.00 (member) to American Management Association, Dept. CP, 330 W. 42nd St., New York 36, N. Y.

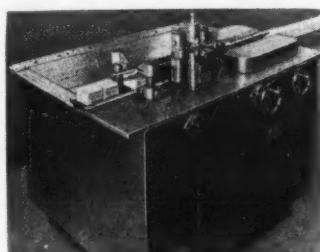
PACKAGING

Rates to 600 units/min achieved by redesigned package imprinter

Uses: For printing identification data and code-dates on top or ends of cartons and boxes as an integral packaging-line operation.

Features: Operating speed of machine has been increased to permit imprinting of small cartons at rates up to 600 units/min. Length of machine now measures only 54" as compared to previous length of 72".

Description: Redesigned Markocoder 3M is said to be more versatile because it can handle cartons of unusual dimensions within its range, as well as rec-



Length of redesigned machine is 54" compared to previous length of 72"

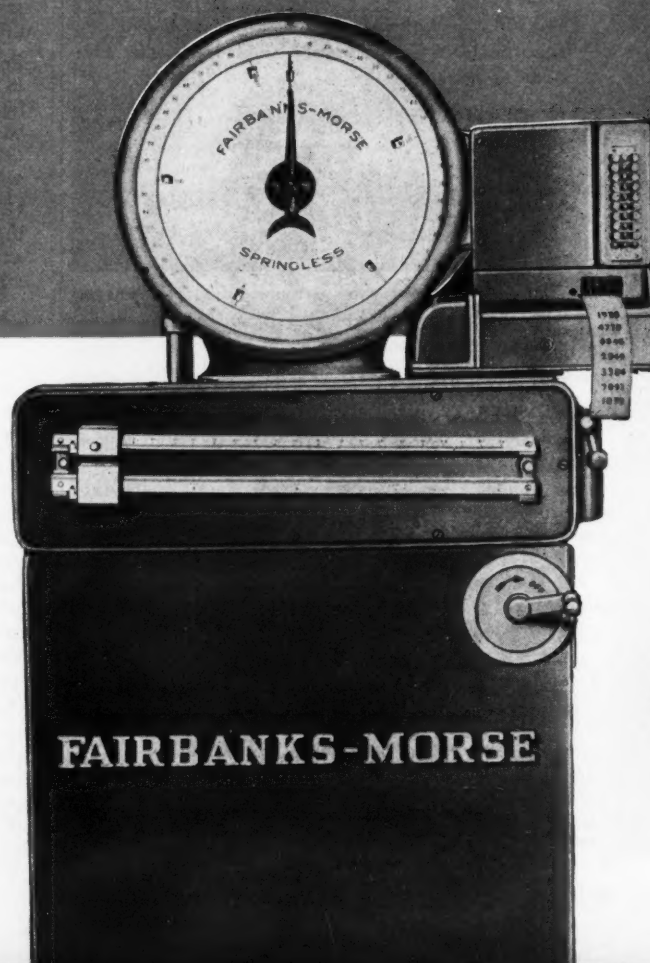
tangular cans. Also, it will print very close to bottom of package instead of requiring a 3/16" margin as heretofore, and can be adjusted for closer registration control during regular imprinting operation.

Additional improvements have been made to permit quicker change-over for cartons of different sizes as well as a more rapid method of changing ink color and die wheel. Ink pump is now an integral part of imprinting machine, eliminating need for separate motor.

(Markocoder package imprinting machine is a product of Adolph Gottscho, Inc., Dept. CP, Hillside 5, N. J. . . . or for more information check CP 5363 on the convenient Reader Service slip between pages 2 and 3.)

For more information on product at right, specify CP 5364 . . . see information request blank between pages 2 - 3. ➡

Keep your weights a matter of record *Automatically!*



Rule out the chance for weighing errors with a Fairbanks-Morse Dial Scale with Printomatic Recorder. You save annoying, costly receiving and shipping disputes—you have a permanent record of each article weighed *automatically!*

The Printomatic is designed so that other pertinent information may also be printed with the weight for accounting or identification purposes. And, there's an electronic control for materials handling and processing.

See your local Fairbanks-Morse Scale Specialist about the Printomatic Recorder . . . and his complete line of scales of all types. Fairbanks, Morse & Co., Chicago 5, Illinois.



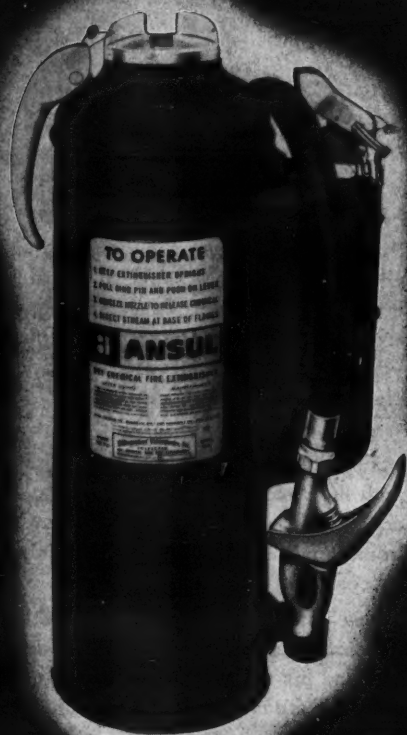
FAIRBANKS-MORSE

a name worth remembering when you want the best

SCALES • PUMPS • DIESEL LOCOMOTIVES AND ENGINES
ELECTRICAL MACHINERY • RAIL CARS • HOME WATER
SERVICE EQUIPMENT • FARM MACHINERY • MAGNETOS

1 9 3 8
4 7 7 0
6 8 4 8
2 9 4 9
3 3 8 4
7 8 9 3
1 0 7 0

FASTER
MORE EFFECTIVE...
MORE DEPENDABLE
FIRE-STOPPING
POWER

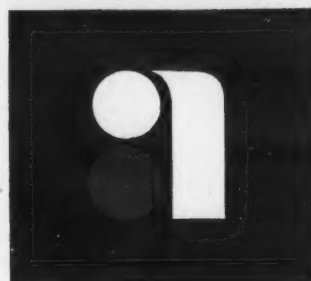


MODEL 20-B



ANSUL
Chemical Company

FIRE EQUIPMENT DIVISION • MARINETTE, WISCONSIN



ANSUL FIRE EXTINGUISHING EQUIPMENT

FASTER . . . A short, quick downward motion of the puncture lever pressurizes the extinguisher and it is ready for instant use.

MORE EFFECTIVE . . . Even the inexperienced operator gets near-expert results because of the ease of operation and handling. In addition ANSUL "PLUS-FIFTY" Dry Chemical has greater fire-killing power.

MORE DEPENDABLE . . . Exclusive ANSUL-ENGINEERED design features include water-tight and corrosion-resistant construction, easy, on-the-spot recharge without special tools and other exclusive Ansul developments which insure greater dependability.

FIRE-STOPPING POWER . . . ANSUL FIRE EXTINGUISHERS have the highest ratings for fire-stopping power ever awarded any type of class B and C fire extinguishing equipment.



Send for File No. B-203. You will receive a variety of helpful printed matter. Included is our latest catalog which describes Ansul Extinguishers of all sizes — from the small Ansul Model 4 to Ansul Piped Systems and Ansul 2000 lb. Stationary Units.

OFFICES AND DISTRIBUTORS IN PRINCIPAL
 CITIES IN THE U. S. A., CANADA AND OTHER COUNTRIES

MANUFACTURERS OF
 DRY CHEMICAL FIRE EXTINGUISHING EQUIPMENT, REFRIGERATION
 PRODUCTS, INDUSTRIAL AND FINE CHEMICALS AND LIQUEFIED GASES

safety

Contest asks chemical workers to analyze job from safety standpoint

**Makes employe realize all of potential
 sources of accident or injury**

Feature of the safety program at one of the larger plants of a major chemical company has been a plan for developing safety programs for each month of the year. Each program highlights some particular phase of accident prevention such as unsafe acts, hand tools, personal protective equipment, etc. A committee develops a "packaged" program which is complete with all of the advertising material, departmental meeting outlines, demonstrations, displays, competitions, and whatever else may be necessary to sell the idea to the employes. The accident frequency rate for this plant has shown a reduction from 3.78 in 1945 to 1.59 in 1952. The "packaged" safety program plan has been in effect for the past four years.

The months of January and February of this year saw a program tried out, complete with contest, called "Job Safety Analysis".

Purpose of the program and contest was to attempt to improve the plant's accident and injury experience by asking employes to identify every possible hazard connected with any aspect of their jobs and then to determine the safe practice which would eliminate or control the hazard.

Generally what was discussed with and expected of the employes is contained in the following sample analysis of a typical job operation (bag filling):

STEP	Position one bag to fill
HAZARD	Possibility of bag flying loose resulting in product being ejected from bagging machine
HAZARD CONTROL	Lock bag in place over spout. In some instances safety glasses may be necessary where there is residual material coming out of spout after bag is removed.

Contest blanks were provided the employes and prizes were awarded for the best overall analysis based on the following points: completeness of job breakdown, thoroughness of safety analysis, and safety recommendations offered for improvement of any hazard or safety procedure.

The use of illustrative sketches was encouraged to clarify an idea. Spelling and grammar were not used as criteria in selecting winning entries. Competition was arranged so that individuals holding certain jobs were competing only with individuals performing similar jobs. In addition, of the eight prizes which were awarded, six were given to employes in the hourly-wage group and the other two within the salary group.

About 20% of the eligible people entered the contest by submitting an analysis covering some part of their job. Actual effect of the program, at this time, is difficult to evaluate. However, another plant of the same company in 1950 carried out a similar program, varying only in detail. Starting just before the program, that plant succeeded in operating over 4,000,000 man-hours without a lost-time accident. This constituted a new company record. It was felt at this plant that the program played a vital part in attaining the record.

(Information on Job Safety Analysis program received from the Plastics Division, Monsanto Chemical Co., Dept. CP, Springfield 2, Mass. . . or for more information check CP 5366 on the convenient Reader Service slip located between pages 2 and 3.)

High heat and flame resistance characterize mastic coatings . . .

organic base chemical also resists action of acids, alkalis and oxidizing agents

Uses: Can be applied to metals, masonry surfaces, glass, fiberboard, wood and asphalt. On interior of metal buildings it prevents condensation, insulates and deadens sound. Applied to underside of trucks and trailers, coating serves as insurance against explosions and burning of truck contents due to occurrence of fire originating underneath the load. Provides a fire-resistant coating on heavily creosoted wood trestles. May be applied on asphalt roofing for fire protection.

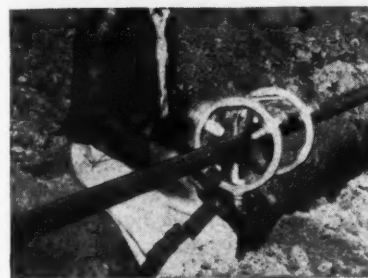
Features: Excellent high-heat, thermal shock resistance is maintained at 5400°F. No flaming is evidenced at these high temperatures, only fusion and sintering. Flame temperature of 2000°F for one hour on 1/2" of Flamemastic applied to 1/2" steel plate prevents the temperature of the steel from rising above 800°F. Flamemaster #3 is approved by the Underwriters' Laboratories for 1/2" fiberboard. Further characterized by high impact; resistance to mildew, corrosion, abrasion and many chemicals. Excellent weathering characteristics.

Description: Flamemastic and Flamemaster #3 are mastics of heavy consistency which are manufactured in two densities. The "coarse" is better for fire-resistance, anti-condensation, sound-deadening and high impact. The other density, known as "fines" is more suitable for resistance to corrosion, abrasion and chemicals, although it reportedly has equal fire-resistance. Flamemaster #3 is an emulsified form of Flamemastic. Both materials, which are organic base chemicals, are available in two viscosities — one for spray application and the other for troweling. Thicknesses as high as one inch are possible.

Products are manufactured ready for use and require no thinning. They are available in white and colors.

(Flamemastic and Flamemaster #3 are products of Ideal Chemical Products, Inc., Dept. CP, 3813 Hoke Ave., Culver City, Calif. . . or for more information check CP 5367 on handy form located between pages two and three.)

Fight corrosion with easy 1-step application



Polyken Protective Tape Coatings are ideal for use on couplings, joints and holidays. Conforms readily, goes on quickly . . . to speed the job and cut costs.

New Polyken Protective Tape Coatings may be applied by portable machine up to 30 feet per minute even by inexperienced workmen.

You can apply this *Polyken* pressure-sensitive tape economically by hand or machine just as it comes off the roll. Pipes are coated uniformly and evenly in one simple step. You don't have to mess with heating or mixing. There are no liquids, solvents or thinners to use . . . no cumbersome or expensive machines to operate or clean . . . and no delay for drying time.

Yet, simple as application is, *Polyken* Protective Tape Coatings can be depended upon to guard pipes against corrosion for a long, long time. And that goes for pipes in any location—above or below ground, in the plant or in the field.

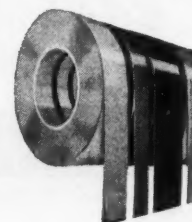
Polyken Tape No. 900, black (also available in gray, No. 910) is the polyethylene plastic tape coating made by an exclusive *Polyken* process. See for yourself how your corrosion problems can be solved this easy way. Mail the coupon for free samples and details.

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222 West Adams St., Chicago 6, Illinois

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Company _____

Street Address _____

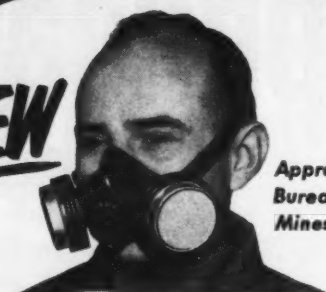
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When inquiring check CP 5368 on handy form, pgs. 2-3

CESCO

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NEW



Approved by
Bureau of
Mines

Organic Vapor Respirator No. 99

• Here's a brand new twin cartridge respirator that fits perfectly. The facepiece is contoured to provide snug, comfortable, leakproof fit without excessive tension of the adjustable dual headbands.

• Positive acting inhale-exhale check valves prevent rebreathing or exhausting through cartridges. Valves are replaced without tools. Two 85cc absorbent cartridges provide ample breathing efficiency. They are easily and quickly replaced by unscrewing retaining caps.

• The CESCO No. 99 Respirator is covered by Bureau of Mines approval No. 2307 for organic vapors not exceeding 1/10 of 1% by volume.

Converts to Dust Respirator No. 96

• By simply replacing the vapor cartridges with CESCO filter pads, the No. 99 Respirator is converted to the No. 96 CESCO Dust Respirator. Filters are treated wool-felt with no outside screens or covers. The entire frontal surface of the filter is usable providing maximum efficiency and little resistance to breathing.

• The No. 96 Respirator is covered by Bureau of Mines approval No. 2167 for all dusts not significantly more toxic than lead.

Dual Purpose Saves You Money

• The unique feature of quick conversion from organic vapor to dust respirator by merely changing the two cartridges or filter pads makes these highly efficient CESCO No. 99 and No. 96 approved Respirators very economical. You buy only one respirator and elements as desired. They save you money.

Send TODAY

for CESCO literature and the name of your
CESCO safety equipment distributor

CESCO



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CESCO FOR SAFETY

OFFICES IN: Atlanta, Birmingham, Boston, Buffalo, Cincinnati, Cleveland, Columbus, Detroit, East Orange, Houston, Kansas City, Knoxville, Little Rock, Los Angeles, Mexico City, D. F., Milwaukee, Montreal, Philadelphia, Pittsburgh, Salt Lake City, San Francisco, Spokane, St. Louis, St. Paul, Toledo, Tulsa

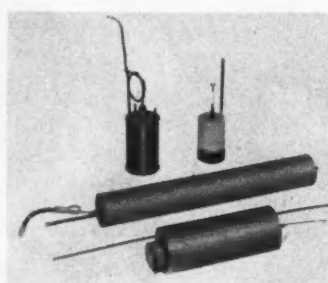
When inquiring check CP 5369 on handy form, pgs. 2-3

SAFETY

Monitor neutrons near radioactive sources

Neutron counters meet a wide range of neutron flux measurement requirements around reactors, accelerators, and neutron sources. They will detect neutrons exclusively in fields of several roentgen of gamma radiation. Counters can be used for remote monitoring and with stationary or portable equipment.

Model F-1 counter has a 2:1 directional response. Model F-2 counter is a non-directional proportional type used for stationary monitoring.



Variety of neutron counters
available

It can be supplied in a plastic probe for immersion in water. Model F-3 is a fast neutron probe widely used in bore-hole surveys. Model F-4 has a built-in alpha source for calibration purposes. It is a tissue-equivalent chamber.

(Counters are products of Radioactive Products, Inc., Dept. CP, 443 W. Congress St., Detroit 26, Mich. . . or for more information check CP 5370, pages 2 and 3.)

Describes portable type fire extinguishers

Eight-page bulletin contains information on various types of portable fire extinguishers for Class A, B and C fires. It also outlines smoke and temperature-rate-of-rise fire detection systems as well as automatic carbon dioxide extinguishing systems for machinery and entire rooms.

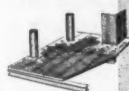
Bul P8R5 is issued by Walter Kidde & Co. Inc., Dept. CP, Main St., Belleville 9, N. J. When inquiring specify CP 5371, pages 2 and 3.

USE THIS NEW SAFETY MATERIAL ALL OVER YOUR PLANT

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NON-SKID—RUGGED—LOW COST

Safety Grip-Strut is a new basic material. All one piece, steel or aluminum, in various sizes and gauges. Sold like lumber, used like lumber. Ideal for on-the-job fabricating. Not welded, riveted or expanded. It presents an open space, in a diamond shaped pattern, in excess of 75% of the area for ready access of light and air and gives a positive NON-SKID footing in all directions. Ideal for stair treads, fire escapes, cable trays, work platforms, catwalks, flooring and for original equipment safety treads. Your own mechanics can install it—it's inexpensive, yet permanent and safe. Write today for new catalog showing loadings and methods of easy application in your plant.

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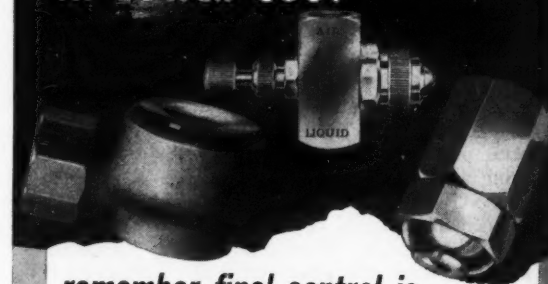
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When inquiring check CP 5372 on handy form, pgs. 2-3

FOR EFFECTIVE SPRAYING AT LOWER COST



*remember final control is
the SPRAY NOZZLE you use!*

In design...choose the Spray Nozzles that give you proper performance, with exact spray pattern, impact, spray angle and capacity. In application...be sure the nozzles as supplied are produced to close tolerances. Metalurgically, make certain the spray nozzles fit your use.

With Spraying Systems you can be sure of spray nozzles to meet all three requirements. Let Spraying Systems Co. recommend Spray Nozzles to meet your needs best.

YOUR GUIDE TO SPRAY NOZZLE SELECTION
Spraying Systems Co. Catalog No. 22... 32 pages, with complete performance data. Also write for Catalog 23...Pneumatic Atomizing Nozzles.

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3216 RANDOLPH STREET • BELLWOOD, ILLINOIS

FOR EFFICIENT SPRAYING MAKE SURE THE NOZZLE IS RIGHT

When inquiring check CP 5373 on handy form, pgs. 2-3

CHEMICAL PROCESSING

**Explosion-proof connectors
feature button-operated,
quick-acting lock . . .**

provide a safe and positive means for opening and closing a current under load

Uses: To provide safe operation of portable electrical equipment in Class I, group C and D hazardous locations. Units also operate as a current-rupturing device — providing a safe method for opening and closing a circuit under load.

Features: Delayed action lock, which is extremely easy and simple to operate, makes it impossible to open or close the circuit except when contacts are confined within explosion-proof chamber. Pressing a button is all that is necessary to release the delayed action lock.

Plug is inserted and withdrawn in a straight line — no turning is necessary nor are separate sealed fittings required.

Description: Strate-line EPD and ERR explosion-proof plugs and receptacles are designed for 15 and 20 amperes, 2-wire 3-pole and 3-wire 4-pole. They



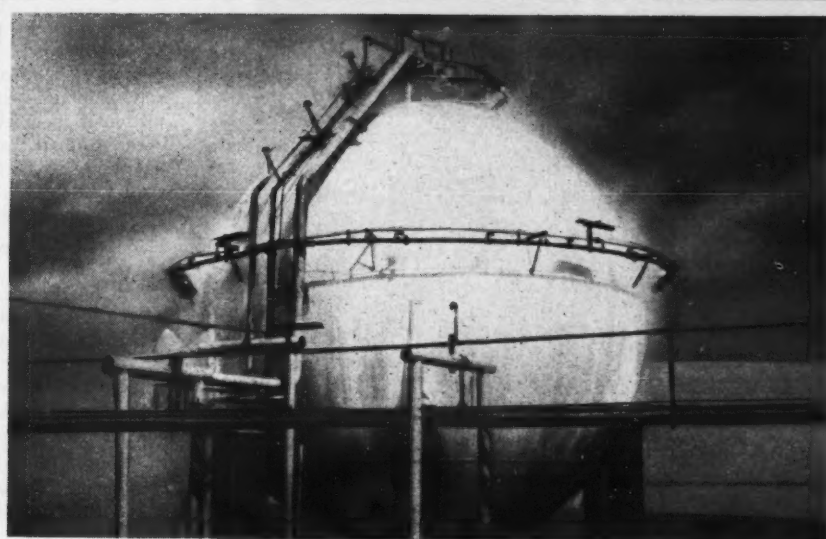
Explosion-proof plug is inserted and withdrawn in a straight line — no turning is necessary

have cast aluminum alloy housings with an extra pole connected directly to the shell for completing the grounding circuit through the conduit system. Units are listed by Underwriters' Laboratories.

(EPD and ERR plugs and receptacles can be obtained from Pyle-National Co., Dept. CP, 1334 N. Kostner, Chicago, Ill. . . . or check CP 5374, pages 2 and 3.)

**Publish safety data sheet on
hydrogen peroxide**

Available is a data sheet on hydrogen peroxide which gives properties and information for the safe handling, storage and use of this compound. A section on health hazards and their control outlines proper personal protective equipment and the first-aid measures in the event of contact with skin and eyes. To obtain copies of Data Sheet SD-53 remit 25c direct to Manufacturing Chemists' Association, 246 Woodward Bldg., Washington 5, D.C.



IT CAN'T HAPPEN HERE!

Protection of flammables calls for a system that goes to work the instant fire occurs . . . that's the reason so many tank farms and other hazardous properties are "covered" by

BLAW-KNOX Automatic FOG SYSTEMS

In the event of a critical temperature rise anywhere within the protected area, not a second is lost. A quenching deluge of water-fog smothers the hot spot at once. Other nozzles go into action to cool off adjacent tanks, and alarms are sounded instantaneously. To get the most effective fire protection ask a Blaw-Knox engineer to make a survey of your property and submit an estimate . . . There is no obligation.



Deluge Systems, Wet Pipe Systems, Dry Pipe Systems, Water Spray and Fog Systems, Rate-of-Rise Sprinkler Systems with new improved Spray Heads, Foam and Carbon Dioxide Extinguishing Systems . . . listed by Underwriters Laboratories, Inc. and approved by Factory Mutual Laboratories.



"Little Joey Sprinkler"
Always on the Job

BLAW-KNOX

BLAW-KNOX COMPANY
AUTOMATIC SPRINKLER DEPARTMENT
Pittsburgh 33, Pa.
CEdar 1-0700

When inquiring check CP 5375 on handy form, pgs. 2-3

SAFETY

How to set up and maintain a safety program

Written for the manager of a small business or the supervisor of a department in a large organization, 94-page publication shows how to set up and maintain a safety program. Detailed information is included on subjects such as plant layouts, material handling, housekeeping, machine guarding, electrical hazards, pressure vessel hazards, first aid, fire prevention and personal protective equipment.

Handbook advises the small businessman who cannot afford to employ a full-time safety specialist how to make use of outside assistance. Service and insurance organizations, governmental agencies, trade associations and professional societies which can help the small operator are described. There are many illustrations along with several check lists.

To obtain "Handbook of Accident Prevention for Business and Industry" remit \$3 (\$1.50 to members) direct to National Safety Council, 425 N. Michigan Ave., Chicago 11, Ill. When inquiring reader may simply specify CP 5377 on the convenient Reader Service slip located between pages 2 and 3.

Develop series of solvents for safe cleaning of machine parts . . .

three products present a wide-spread selection with flash points from 140° to 280°F

Uses: Any of the series are recommended for degreasing and cleaning of electrical equipment and all metal parts.

Features: Dry fast and leave no deposit.

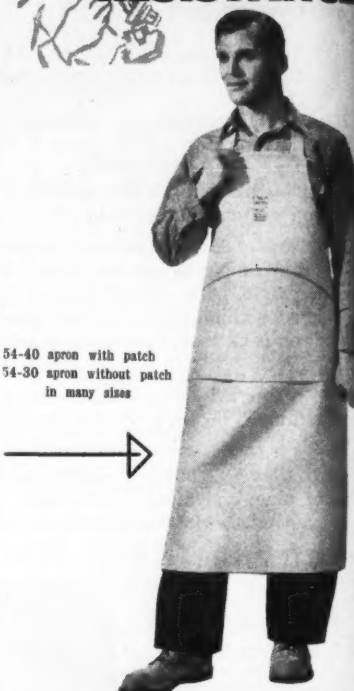
Description: Slow evaporation rate of Harco Metal Cleaner combined with a high flash point assures a safe, longer operating cycle with little loss of solvent. It may be applied by brushing, spraying or dipping.

Harco L-D Safety Solvent is designed and recommended to eliminate the hazards of carbon tetrachloride and similar chlorinated solvents. It can be used for dip, brush and wipe cleaning. It may be sprayed when normal safety regulations regarding ventilation and fume exposure are followed. Harco H-D Safety Solvent is a fast drying, high flash, heavy duty cleaner meeting military requirements for cold cleaning.

All three solvents are water white compounds with the following flash points (method of determination in parentheses): Harco Metal Cleaner (Tag c.c.), 175°F; Harco L-D Safety Solvent (Pensky-Martin c.c.), 140°F; Harco H-D Safety Solvent (Pensky-Martin c.c.), 280°F.

(Samples may be obtained on request from Harco Chemical Co., Dept. CP, 338 North Ave. E, Cranford, N. J. . . . or for more information check CP 5378 on handy form, pages 2 and 3.)

For greater CHEMICAL RESISTANCE



54-40 apron with patch
54-30 apron without patch
in many sizes

insist on APRONS

by *Sawyer*

Highly resistant to acids, alkalis, oils, greases and other chemicals. Not affected by gasoline or most solvents.

Easy to clean — can be scrubbed in hot water or caustic solutions — or dry cleaned — positively will not crack, blister or peel.

100% waterproof — made with top quality base fabric saturation-coated first and then coated with 6 coats of Neoprene Latex.*

Tough as mule-hide — wear like iron, take endless snagging, rubbing, scraping, and still give full protection.

Also: Industrial suits, three-quarter and long coats, coveralls, and many other styles. All clothing made in black and yellow.

*Sawyer fabrics are coated by The Brunse Company, a division of

THE H.M. SAWYER & SON CO.

FROG BRAND

CAMBRIDGE MASSACHUSETTS

When inquiring check CP 5379 on handy form, pgs. 2-3

CHEMICAL PROCESSING

THOROUGHLY TESTED
FOR EXPOSURE • SUPERIOR WATER DISTRIBUTION •
FOR CONCEALED PIPING SYSTEMS • FOR CONCEALED SPRINKLERS
• FOR EXTRA HAZARD PROTECTION • PERMIT WIDER BUILDING SPACING
• GREATER SPRINKLER EFFICIENCY • NO COSTLY PIPING CHANGES
• LOWER INSTALLATION COST
• LESS TOTAL WATER VOLUME
• FOR ORDINARY HAZARD
• IMPROVED PROTECTION
• FEWER HEADS OPERATE
• INTERCHANGEABLE
• FULLY APPROVED
• FOR EXTRA HAZARD
• IMPROVED PROTECTION
• DEPENDABLE PERFORMANCE
• WIDE
• TESTED
• CONCEALED
• SUPERIOR WATER DISTRIBUTION
• NO COSTLY PIPING CHANGES • GREATER SPRINKLER EFFICIENCY
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When inquiring check CP 5376 on handy form, pgs. 2-3



Case No. 207: Handling sharp edged metal products in hot acid solutions. Correctly job-fitted gloves reduced hand injuries 78% and saved 6¢ per man-hour on glove replacement cost.

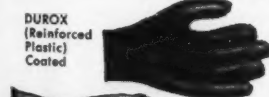
We fit the glove to the job...

Savings of 40% to 70% of glove costs to employees or management, and comparable reductions in hand injuries, are being effected by replacing old-type work gloves with Edmont coated gloves designed for the job condition. With the cooperation of America's largest industries we have developed and test-rated gloves for any combination of service requirements listed below. Tell us your operation. Without cost we will send test samples of the correct glove, and name of distributor who can supply you.

Edmont Case No. 208: Handling explosives in fibre cases. Job-fitted gloves, palm-coated with rough textured natural rubber, outwore leather palm gloves 3 to 1 and gave positive non-slip grip at all times.

Edmont Case No. 419: Chemical company working in acids and strong solvents. Job-fitted gloves coated with NEOX (specially reinforced neoprene) outwore rubber coated gloves more than 4 to 1.

Edmont Case No. 272: Handling thin strips of stainless steel. Job-fitted gloves, palm-coated with cut-resistant reinforced neoprene, wore 8 times longer than canvas gloves (224 hours vs. 28 hours) with comparably greater protection.



We make 34 types of coated industrial gloves. Complete catalog on request. Address Edmont Manufacturing Co., 1204 Walnut Street, Coshocton, Ohio.

Edmont job-fitted gloves
Largest selling line. Supplied by leading industrial distributors

Abrasion Resistance
Cutting Resistance
Snagging Resistance
Flexibility
Wet Grip
Dry Grip

Acids:

Sulphuric—98%
Sulphuric—10%
Nitric—70%
Nitric—10%
Hydrochloric—38%
Hydrochloric—10%
Chromic

Solvents:

Turpentine
Stoddard Solvent
White Gasoline
Benzol
Cutting Oil
Acetone
Methyl Ethyl Ketone
Kerosene
Lacquer Thinner

Caustics:

Potassium Hydroxide—50%
Sodium Hydroxide—50%
Lye
Trisodium Phosphate

Degreasants:

Trichloroethylene
Carbon-tetrachloride

**Reaches 2500 psi
for charging
tanks...**

football-size compressor tailored for breathing units

Uses: Compressor is specially designed for charging industrial breathing equipment such as Scott Air Pack and similar gear.

Features: Over-all dimensions of compressor are only 10½ x 13 x 7".

Description: Rated discharge pressure of midget compressor is 2500 psi. Three-stage design is engineered for V-belt drive from any power source of ½ hp or more.



Three-stage compressor is air cooled

Reported performance is 70 cubic feet of free air compressed to 2350 psi in 100 minutes when driven at 5000 rpm. Unit will operate throughout ambient temperature range of 0° to 100°F.

Modified compressor has identical performance, but is driven by integral 110 v AC motor.

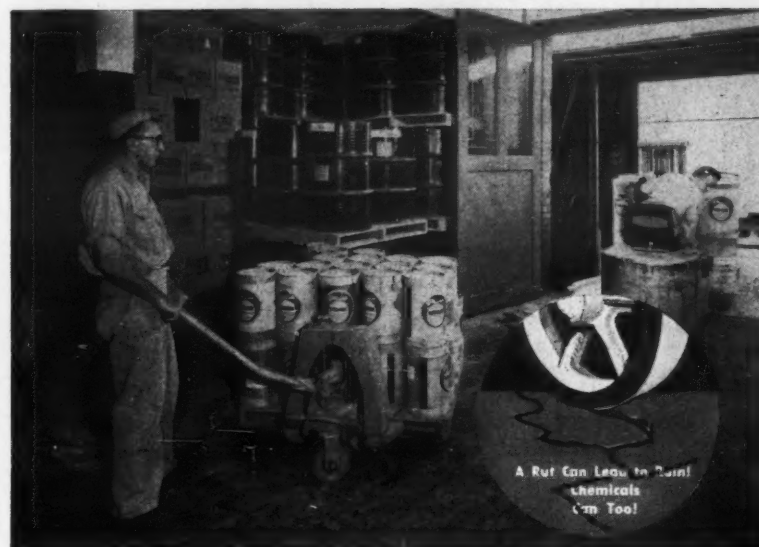
Compressor is air cooled and supplied with a relief valve. Pressure gage's range is 0 to 3000 psi. Mounting base and air hose are optional. Combination filter and moisture separator is available for exclusion of oil mist or fumes during compression. Oil reservoir and pump are built into unit.

(Model 32R1500 Air Compressor is a product of The Cornelius Co., KP-CP, 550 39th Ave., N.E., Minneapolis 21, Minn. . . or for more information check CP 5381 on handy form located between pages 2 and 3.)

SAFETY

FLOOR TROUBLES CALL FOR HELP?

Get facts on **HEXTEEL® Heavy-Duty Surface Armor**
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A Rut Can Lead to Ruin!
chemicals
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Chemical industry fights costly, vexatious floor problems with

HEXTEEL® Heavy-Duty SURFACE ARMOR
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IN the wet end of the paper industry, in storage battery manufacturing, in anodizing plants—in scores of industries the public seldom associates with chemical operations—as well as in chemical plants themselves, HEXTEEL and FLOORSTEEL reinforced floors are opening maintenance executives' eyes to the needlessness of frequent floor resurfacing. If this costly nuisance is one of your headaches, take your first step toward ending it by mailing coupon today!

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MAIL COUPON OR TELEPHONE NOW!

Let the specialized Klemm engineer know your problem, give you complete information on HEXTEEL and FLOORSTEEL. Write today. If you have an immediate problem, phone Klemm (collect) NOW. No obligation!

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Please send me information about HEXTEEL and FLOORSTEEL as used in the chemical industry.

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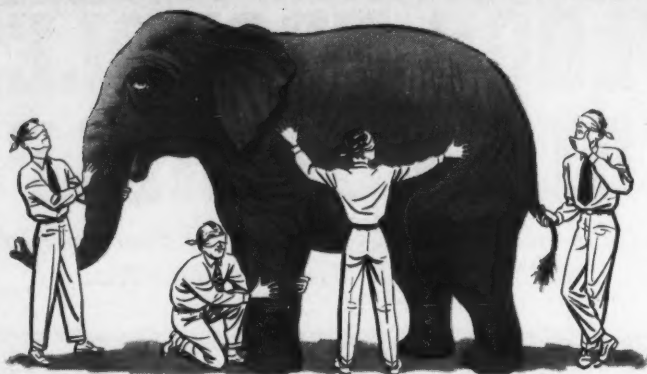
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CITY _____

STATE _____

CP-12

When inquiring check CP 5382 on handy form, pgs. 2-3



Remember the Aesop fable where four blind men each felt a part of an elephant and decided differently as to what it was? The moral of this fable is—you need to have ALL the facts before you know the **WHOLE** story.

What Does Mean to Your Industry

We at Goslin-Birmingham frequently find that a customer in a given industry is familiar with only one phase of our activities and does not realize how diversified our engineering and plant facilities really are.

To the Chemical Industry

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To the Pulp and Paper Industry

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To the Petroleum Industry

GB furnishes filters for both MEK and Propane dewaxing plants.

To the Sugar Industry

GB has for generations furnished mills, evaporators and pans to the industry.

When you are in search of engineering consultation or a competitive bid on any type of equipment . . . call, wire or write us!

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MANUFACTURING CO., INC.

BIRMINGHAM, ALABAMA

CHICAGO: F. M. deBeers and Associates, 20 N. Wacker

When inquiring check CP 5383 on handy form, pgs. 2-3

*processing
equipment*

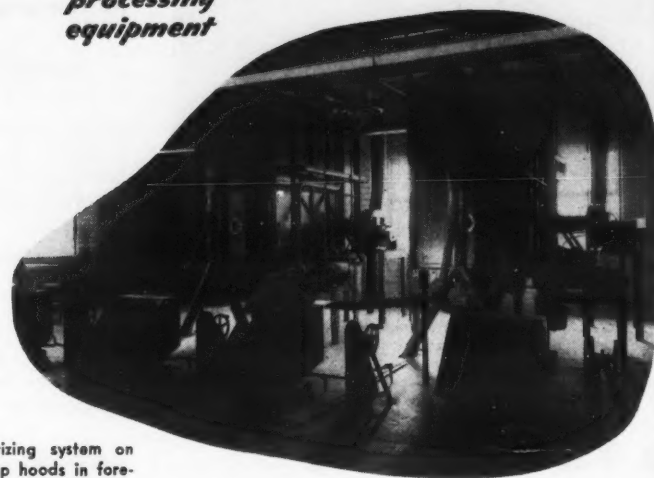


Fig 1—View of pulverizing system on second floor shows dump hoods in foreground, air conveyor ducts in center, and collectors in background

EXTREME CLEANLINESS, LOWER COSTS RESULT WITH AIR CONVEYOR

Enclosed system used in conjunction with continuous pulverizing process makes it easy to maintain purity of talcum powder

Problem: When The Mennen Co. of Morris Plains, N. J., was making plans for its new plant, which was opened a few months ago, design of the pulverizing system for talcum powder was a major consideration. Formerly this operation was carried on in a four story building, material flowing by gravity through pulverizers and down to packaging line.

One disadvantage of this system was the amount of material handling necessary in moving talc to the fourth floor. Necessity of employees performing operations on several different levels was also undesirable. Also, the old system had a collector which gathered the dust from all of the powders being processed. For this reason, the powder was not always salvageable.

Of paramount importance in the design of the pulverizing system for the new plant was the maintenance of the cleanliness and high quality so necessary in this type of product. Additional capacity was

also needed in the plant.

Solution: Consideration was given to using either moving conveyors or air to transfer the talc from one machine to another, the decision being made to use the latter medium. Ducts of the Mikro Air Conveying System installed may be seen in Fig 1, which also shows other sections of the processing system on the

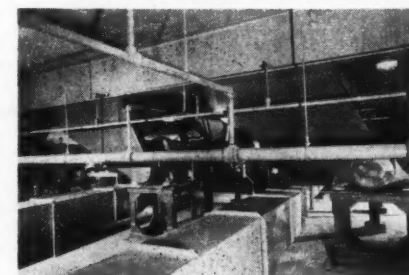


Fig 2—Mezzanine showing mixers, storage tanks, and pulverizers

second floor of the new Mennen plant. Three of the four dump hoods used are visible. Mikro-Collectors in background have a capacity of 7000 cfm and handle 380 grains of material/cu ft of air.

Each dust collector contains eight felt

filter cylinders 18" in diameter and 84" in length. A Hersey reverse-jet cleaning ring travels continuously up and down the bag to remove the product as it is collected and makes possible the high filter rates. Constant pressure is maintained throughout the system.

Fig 2 shows the mezzanine, just below the second floor. Here four pre-mixers, four Mikro-Pulverizers, and two storage tanks are used. Each pulverizer grinds and blends 5400 lb/hr. Entire system is divided into two processing units, each containing one collector, two pulverizers, two mixers and hoods, one bin, and one packaging machine.

From the dump hoods shown in Fig 1 the powder flows by gravity to the pre-mixers and is then discharged into the pulverizers. From the pulverizers the material is air conveyed to the dust collectors, which also vent the dust from the dump hoods. After de-aeration in collector, which permits product to be more readily packaged, material passes through

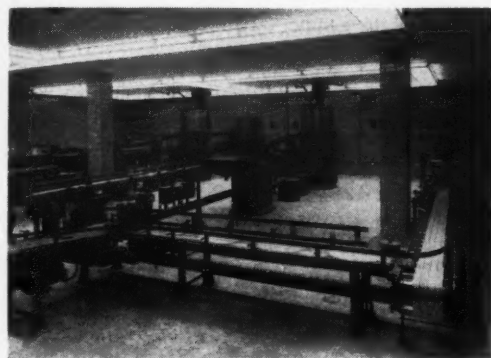


Fig 3—Cylindrical packaging units are shown in rear in this view of first floor

dustless airlock into a small storage bin which is also vented by collector. Powder then flows by gravity into packaging line on first floor, as shown in Fig 3. Cylindrical packaging units shown in background, each of which has its own separate filter tank, are also vented to the collector.

Entire pulverizing system occupies a floor space of approximately 26 x 30', or 780 sq ft, and rises to a height of 32'.

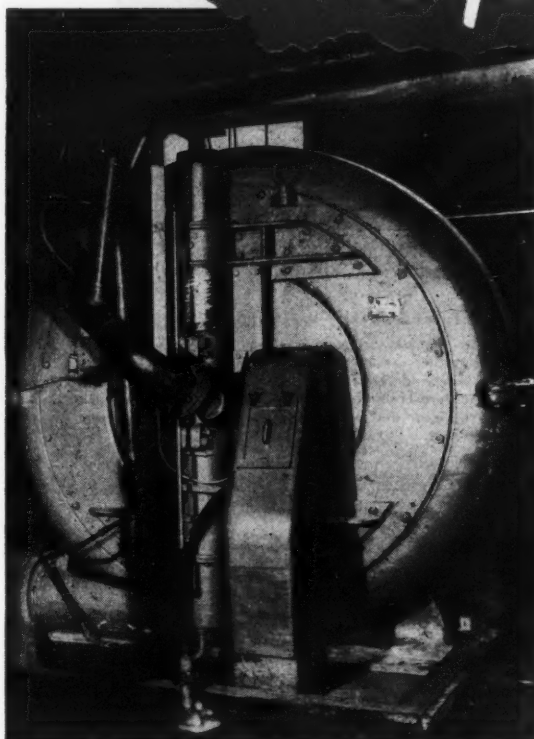
Results: The air conveying and pulverizing system at the Mennen plant has been found to provide extreme cleanliness in grinding, blending, filtration, and in materials handling. Air conveyor protects product against the metallic contamination often resulting from moving parts of mechanical conveying systems. Materials handling has been made much easier by confinement of process to 2½ floor levels.

Total enclosure of system also eliminates any possibility of contamination by dust or other materials from the surrounding area. It is said that a powder so uniform and smooth is obtained that the perfect blend is clearly discernible in a rub-out under a microscope.

(Continued on next page)

Which Centrifuge can provide

the best solution to your problem?



One of seven 67" Reineveld Centrifuges now operating in the world's largest potato starch factory.

This is a question that only *you* can answer . . . because you know the full details concerning your application.

But even complete knowledge of all your needs will not assure your picking the right centrifuge unless you know about ALL centrifuges that can answer your problem.

**WE'D LIKE TO TELL YOU ABOUT
REINEVELD CENTRIFUGES
THROUGH OUR BOOKLET 4-RC-3**

Review this booklet and compare centrifuges in detail . . . prices, production, square feet of filtering surface, construction, weight, maintenance or by any yardstick you choose.

Then if you don't honestly believe that Reineveld Centrifuges compare favorably with any other centrifuge of its type from any angle . . . throw the booklet away and forget about what we've said.

But if you agree with us that the Reineveld Centrifugal Machines offer you practical operating advantages . . . then it will pay you to call on Reineveld and Heyl & Patterson for profitable suggestions on your centrifuging problems.

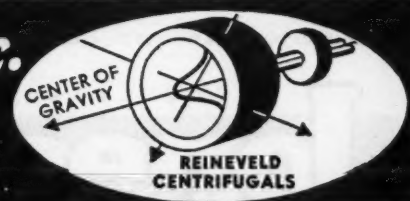
Send today for your copy of Booklet 4-RC-3.

Heyl + Patterson, Inc.

"SINCE 1887"

55 FORT PITT BLVD.

PITTSBURGH 22, PA.

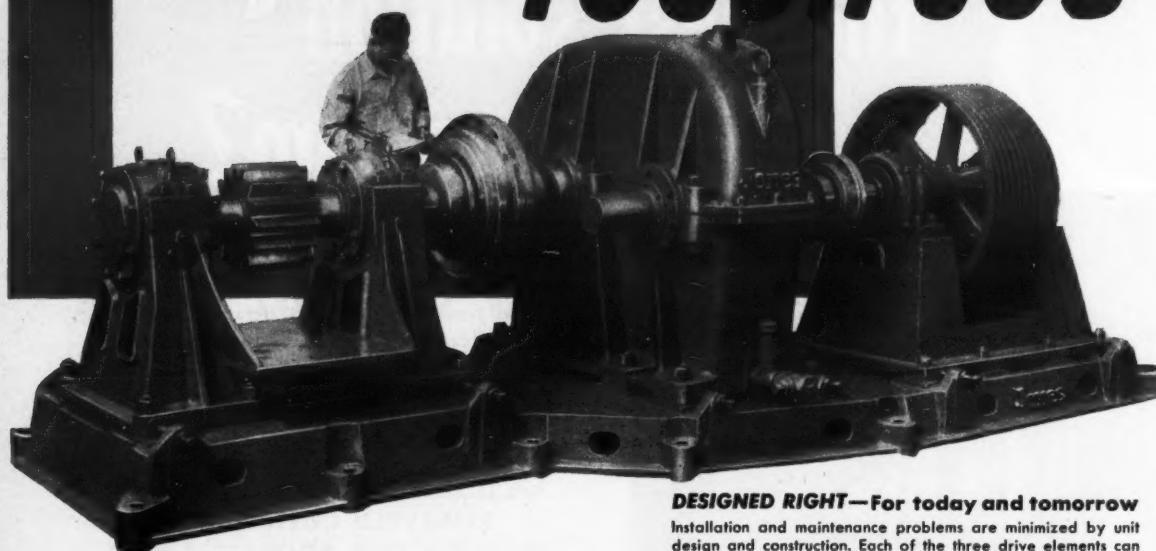


When inquiring check CP 5384 on handy form, pgs. 2-3

ANOTHER JONES

Engineered Kiln Drive

Ready for a... **TOUGH JOB**



Rotary kilns are tough on drives and when it comes to designing kiln drives, there is no substitute for experienced engineering. Each kiln presents a different drive problem—each drive demands careful study and consideration of all operating details to insure the most satisfactory performance and long, dependable life.

Here is where Jones' EXPERIENCED ENGINEERING counts—35 years' successfully engineering hundreds of rotary kiln drives assures a better engineered design, more sturdy construction, and more stay-on-the-job dependability.

Drives for rotary kilns are only a part of the industry-wide applications on which Jones speed reducers are giving outstanding, dependable performance. The complete Jones line offers a size and type of gear drive to fit any industrial power transmission need—small or large—from one up to hundreds of horsepower.

When gear drives for new equipment are being considered, or when replacing old, inefficient drives, for complete satisfaction and long range economy it will pay to consult Jones.

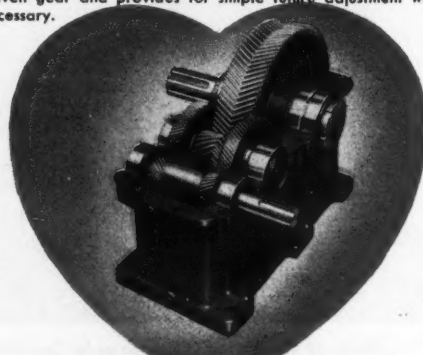
W. A. JONES FOUNDRY & MACHINE CO., 4465 W. Roosevelt Rd., Chicago 24, Ill.

Jones SINCE 1890 . . . IN THE SERVICE OF INDUSTRY

HERRINGBONE WORK ON THE HUBS GEAR SPEED REDUCERS
CAST IRON PULLEYS • CUI GEAR • V-BELT SHEAVES
ANTI-FRICTION PULLEY COUPLERS • FLEXIBLE COUPLINGS

DESIGNED RIGHT—For today and tomorrow

Installation and maintenance problems are minimized by unit design and construction. Each of the three drive elements can be independently adjusted or removed. The separate pinion stand permits more perfect initial alignment between pinion and driven gear and provides for simple future adjustment when necessary.



A rugged, dependable Jones Herringbone Gear Speed Reducer is the heart of the drive pictured above. Jones offers the most complete line of Herringbone Gear Reducers available anywhere with capacities from 1 to 500 horsepower for every type of industrial application. Ratios range from 1.27 up to 355.8 to 1 in single, double and triple reductions. All units are anti-friction bearing equipped throughout in styles for torque connection or overhung load. Ask for Jones Catalog No. 70.

PROCESSING EQUIPMENT

(Continued from preceding page)

Present system allows virtually 100% product recovery. Trouble with different types of powder formerly being mixed in a conventional bag-type collector has been overcome. Additional capacity has been provided by the new system which can handle 10 tons per hour, representing an increase of more than 100% over the old system with precisely the same amount of pulverizing equipment. Little or no maintenance has been necessary in the six months the system has been in operation.

(Product of Pulverizing Machinery Co., Dept. CP, 24 Chatham Rd., Summit, N. J. . . or for more information check CP 5385A on handy form, pages 2 and 3.)

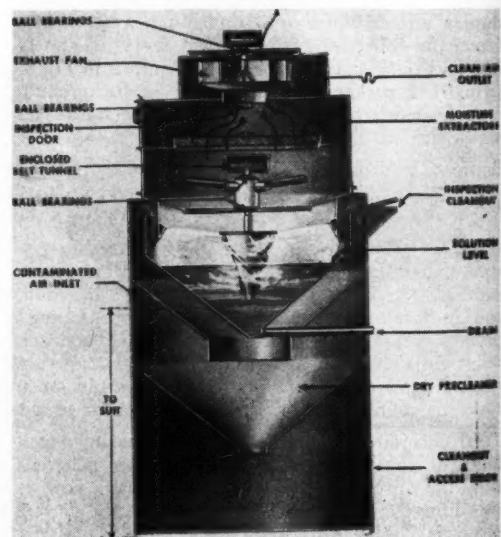
Dust and fumes eliminated by 500 to 50,000 cfm units . . .

independently driven rotor and fan make it simple to handle varying loads

Uses: Dust and fume elimination. One type offered is for wet collection and elimination only, while the other is combination primary dry and secondary wet collection unit.

Features: Manufacturer emphasizes low ratio of power to rated capacity, and high ratio of water circulated to air volume handled. Independently driven rotor and fan permit adjustments to meet load and operating conditions. Other advantages reported are: automatic liquid level control, self-acting skim-off of floating particles collected in tank and optional location of air inlet arm.

Description: Centri-Merge vertical-rotor eliminators combine the cyclonic principle of dust separation and the action of high-pressure water. (For



Schematic view of dust and fume eliminator which incorporates both dry and wet type operation

PROCESSING EQUIPMENT

some applications, liquids other than water may be used.) Capacities range from 500 to 50,000 cfm; fans may be integrally constructed with the unit, if desired.

Material collected in tank is removed by drag conveyor, skim-off or manual clean-out. Clean-out doors permit cleaning while unit is operating. Bearings are out of the liquid and enclosed in dust-tight covers; bearings may be lubricated from outside the unit.

(Eliminators are made by Schmieg Industries, Inc., Dept. CP, PO Box 4701, Detroit 34, Mich. . . . or for more information check CP 5386 on handy form, pages 2 and 3.)

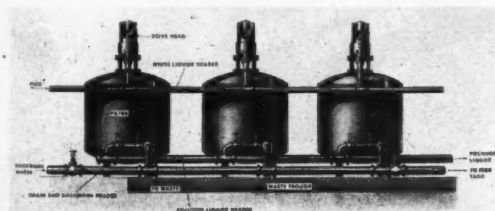
Polish filtration of white liquor assures brighter pulp . . .

station is supplied complete with filters, piping, valves and control instruments

Uses: Designed to provide a final polish to effluent from a white liquor clarifier in paper mill. Applicable wherever pulp brightness is a factor.

Features: Removes colloidal impurities and fine carbon particles too fine for economical gravity settling, thereby assuring a brilliantly clear cooking liquor. This in turn means a uniformly brighter pulp, regardless of variations in settling and slaking conditions in the recausticizing operation.

Description: The Dorrco White Liquor Polishing Station consists of one or more vertical pressure type filters and all necessary piping, valves and control

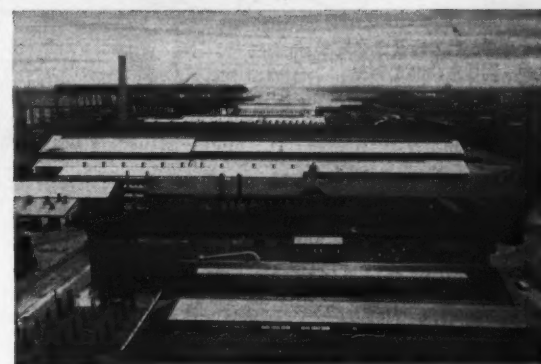
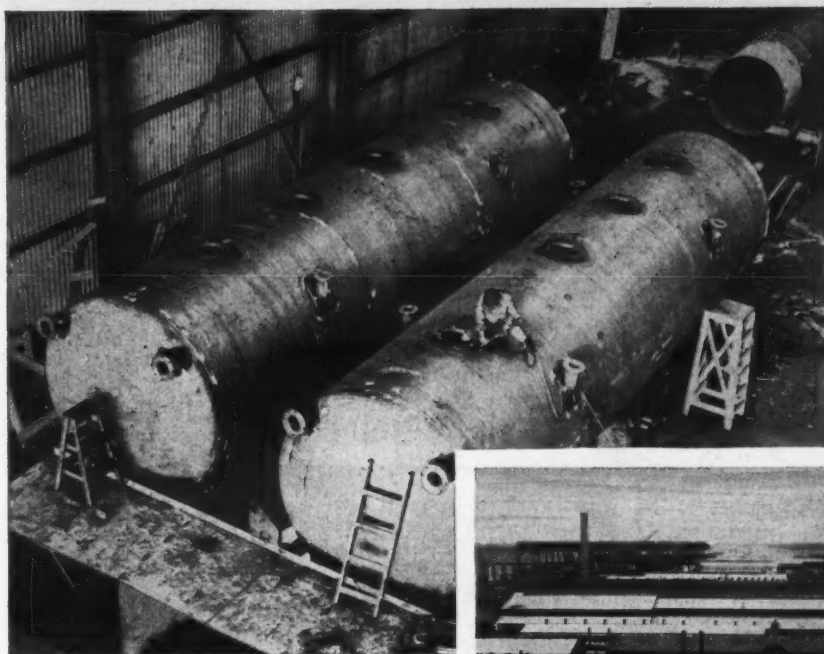


Artist's sketch of white liquor polishing station

instruments. Each filter is equipped with a built-in motor-driven rake agitator with vertical paddle members which extend into the filter bed of precisely graded anthracite coal. During backwash, this agitator aids in release of entrained impurities, breaks up the film of impurities on the surface of the bed, and serves to maintain the anthracite bed in good condition.

Installations of single or multiple units are available with inside filter diameters ranging from 66 to 96". Design flows for the individual filters range from 50 to 100 gpm.

(Station is offered by The Dorr Company, Dept. CP, Barry Place, Stamford, Conn. . . . or for more information reader may simply check CP 5387 on the handy Reader Service slip located between pages two and three.)



A Mile of Shops — Each shop is devoted to a special type of heavy production. Included are complete Machine Shops, casting, forging and other facilities which offer all of the advantages of the execution of the complete job.

A half mile of pressure vessels

These are two of seventy — over 1/2 mile — of 38 1/2-foot vacuum tank casings built to meet the quality requirements of a well-known chemical maker.

The buyer also benefits from many savings made possible by Newport News extensive heavy fabrication equipment and the sixty years experience in using it.

Do you plan installations of heavy production equipment? You can command the services of Newport News for weldments of

corrosion-resistant, alloy and clad metals in almost any size or shape, plus the required engineering background and complete welding and stress-relieving skills.

It will pay you to get the facts, shown in *Facilities and Products*. As you glance at its photos and brief captions, you'll see why Newport News can turn out — at low cost — specialized heavy equipment for chemical plants.

Send for *Facilities and Products* — free — today.

Newport News Shipbuilding and Dry Dock Company Newport News, Virginia


When inquiring check CP 5388 on handy form, pgs. 2-3

WE JUMPED PRODUCTION WITH THIS CENTRIFUGAL



AN A.T.&M. SUCCESS STORY BY SAM SPINNER

THESE PIGMENT FILTERS ARE A HEADACHE, SAM. THEY DO THE JOB ALL RIGHT. BUT EVERY TIME WE CHANGE COLORS, WE HAVE TO CLEAN THE FILTERS—AND PRODUCTION STOPS



LATER

WORKS GREAT! SPINS THE MOISTURE OUT ... AND NO TIME LOST

THE FILTERING ELEMENT THAT LINES THE BASKET GETS CLEANED IN A HURRY, DOESN'T IT?



WHY NOT USE A CENTRIFUGAL TO DO YOUR FILTERING AND DEHYDRATING? FORGET THE FILTERS!



SURE! AND ANOTHER THING—WE CAN PROCESS LARGER BATCHES NOW AT GREATER SPEED. IT SAVES US MONEY, SAM. WE LIKE IT



FREE ILLUSTRATED BOOKLET

AMERICAN TOOL & MACHINE COMPANY
1412 Hyde Park Avenue, Boston 36, Mass.

Please send me my free copy of the new AT&M booklet "Centrifugal Force." I am interested in the following processes:

Separation ☐ Extraction ☐ Dehydration ☐ Clarification ☐ Coating ☐
Filtration ☐ Draining ☐ Thickening ☐ Impregnation ☐ Sedimentation ☐

ANY OTHER PROCESS.....

SAVE TIME, SPACE
AND COSTS WITH

A.T. and M.
CENTRIFUGING

Name.....Title.....
Company.....
Street.....
City.....Zone.....State.....

When inquiring check CP 5389 on handy form, pgs. 2-3

PROCESSING

Reactors for clarifying, softening of water

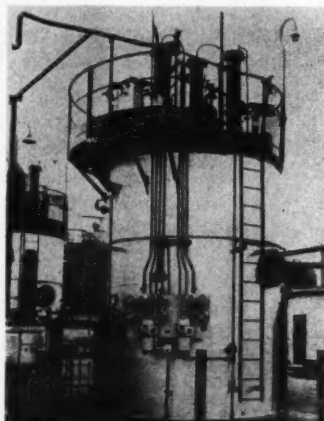
Units for clarifying and/or limes softening water (solids-contact reactors) are shown and described in 24-page bulletin. Chemical feed and auxiliary equipment are also discussed. Bul 5001-A is issued by Cochrane Corporation, Dept. CP, 17th St. below Allegheny Ave., Philadelphia 32, Pa. When inquiring specify CP 5390 on handy form, pages 2 and 3.

Acid treatment of lube oil is faster in continuous, controlled process...

electric field speeds coagulation and settling of sludge

Continuous, automatically controlled acid treating of lube oil provides better utilization of acid and reduces contact period to an hour or less. In addition, amount of sludge left in treated stock is lower, and hence a "water-gathering" operation can be eliminated in the case of lighter lube oils.

Mainspring of process — the Petreco process — is an electric "treater" which brings about very rapid co-



Unit for continuous treatment of lube oil with acid

agulation and settling of the sludge due to the effect of an electrical field. Because of this, mixing of the acid and raw lube stock can be more intense than where simple gravity settling is employed.

Oil from the treater goes immedi-

Order direct from factory!

Prompt shipment anywhere on complete line of high quality —

"Metalsmiths" Stainless Steel and Monel Utensils

Get New Catalog!

Order with confidence. Over 30 years' supplying process industries. Highest quality materials and workmanship for durable, corrosion-resistant service. Additional items — beakers, stock pots, batch cans, shovels. Get catalog — Send a trial order.



WRITE FOR LATEST CATALOG — PRICE LIST

METALSMITHS

Division of Orange Roller Bearing Co., Inc.

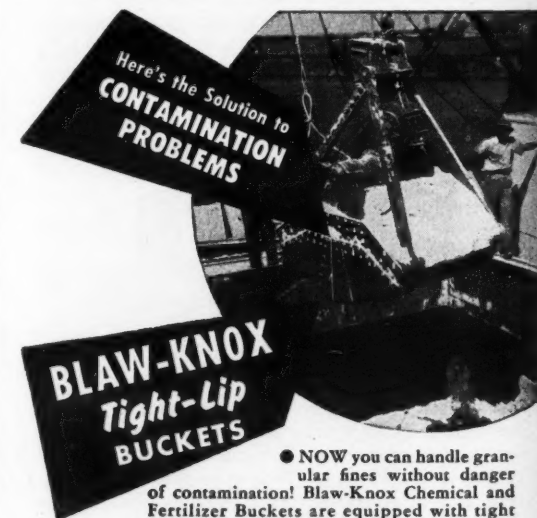
562 White Street

Orange, N. J.

When inquiring check CP 5391 on handy form, pgs. 2-3

Here's the Solution to CONTAMINATION PROBLEMS

BLAW-KNOX
Tight-Lip
BUCKETS



● NOW you can handle granular fines without danger of contamination! Blaw-Knox Chemical and Fertilizer Buckets are equipped with tight fitting cast chrome-nickel-molybdenum alloy steel lips to stop leakage and resist abrasion. For a detailed description on all the important features, write for Bulletin 2236.

BLAW-KNOX COMPANY

Blaw-Knox Equipment Division
2076 Farmers Bank Bldg., Pittsburgh 22, Pa.
Offices in Principal Cities

BLAW-KNOX CLAMSHELL BUCKETS
FOR CHEMICAL AND FERTILIZER PLANTS

When inquiring check CP 5392 on handy form, pgs. 2-3

CHEMICAL PROCESSING

PROCESSING

ately to the neutralization step, while the sludge is drawn off for disposal or re-use. Automatic draw-off minimizes entrainment of lube stock in the sludge.

Treating system is entirely closed, eliminating possibility of air pollution due to escape of corrosive or noxious vapors.

Petresco treaters now in commercial use have a volumetric capacity of 90 bbl and are processing 2500 to 4000 bbl/day, depending on type of oil being treated.

(Process belongs to Petrolite Corporation, Petresco Division, Dept. CP, 1390 E. Burnett St., Long Beach 6, Calif. . . . or for more information check CP 5393 on handy form, pages 2 and 3.)

Ball mill, 30" diam, is for small plant or pilot work . . .

18" length can be converted
into 36" length

Uses: Wet or dry grinding in small-tonnage production and in pilot plant.

Description: Ball mill is available in one diameter, 30" inside the liner, and two lengths, 18 and 36". Small mill can be made into large one by use of interchangeable liners, lifter bars, and end liners.

Standard mill has alloy iron shell, hard iron liners, cast tooth gear, drum or reversible scoop feeder with Decolloy (hard nickel-iron alloy) wearing lip, and steel cast tooth pinion gear. Shell and head liners of any material, such as manganese steel or Decolloy are available.

Small or large discharge trunnion opening is available on the 30 x 18" mill; but small opening only on the 30 x 36" mill. Either right or left hand drives may be specified.

(Economy 30" mills are made by Denver Equipment Company, Dept. CP, 1400 17th St., Denver 17, Colo. . . . or for more information check CP 5394 on handy form, pages 2 and 3.)

For more information on product at right, specify CP 5395 . . . see information request blank between pages 2 - 3.



Expert Handling of Every Process Filtration Job Offered by Eimco

Illustrated here are some of the various types of continuous vacuum and pressure filters designed and built by Eimco Engineers.

From the smallest pilot plant filter station to the largest full production plant size filter, Eimco makes all types. We are prepared to test your product and recommend the model best suited to do your job and work efficiently in your flow sheet.

If yours is a simple dewatering job or a complicated selective hot acid separation process there is an Eimco filter that will do the job better, cheaper and faster.

Let engineers, with the experience of Eimco design and operating men behind them, help solve your filtration problems. Write today.

EIMCO

A463

THE EIMCO CORPORATION

The World's Leading Manufacturer of Vacuum Filtration Equipment
EXECUTIVE OFFICES AND FACTORIES - SALT LAKE CITY 10, UTAH, U. S. A.

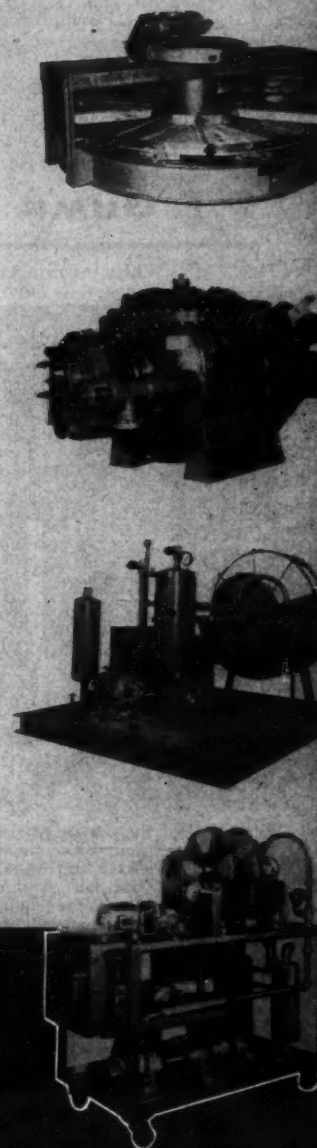
BRANCH SALES AND SERVICE OFFICES:

NEW YORK: 31-32 SOUTH STREET • CHICAGO: 3319 SOUTH WALLACE STREET
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KELLOGG, IDAHO: 307 DIVISION ST. • LONDON: W. 1, ENGLAND: 190 PICCADILLY

IN FRANCE: SOCIÉTÉ EIMCO, PARIS, FRANCE

IN ENGLAND: EIMCO (GREAT BRITAIN) LTD., LEEDS 12, ENGLAND

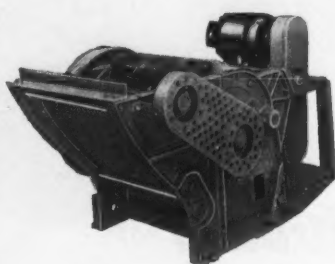
IN ITALY: EIMCO ITALIA, S.P.A., MILAN, ITALY



QUALITY AND CAPACITY CONTROL with Accurate DRAVER FEEDERS to Regulate the Flow of Dry Materials

No need to run production machines under capacity for fear of overloading. Use a Draver Percentage Feeder to regulate the flow of materials to sifters, dryers, elevators, grinders and other production units. You can then easily adjust capacity for maximum, efficient production. Free and non-free flowing products will be fed uniformly and continuously. You will save power and time, eliminate choke-ups and wasteful reprocessing . . . avoid excessive wear on your equipment.

And, if uniform proportioning and mixing of dry powdered, granular or flake materials are required in your process, two or more Dravers (one for each ingredient) will assure thorough blends to formula with minimum production costs . . . result in



quality control of product. Send data on your capacity regulating or blending requirements and let our engineers help plan quality and capacity control with you. No obligation—write today.

Gump-Built Equipment for chemical plants includes Draver Feeders and Draver-Master Continuous Mixing Systems, Bar-Nun Rotary Sifters, Vibro Packers, Bar-Nun "Auto-Check" and Edtbauer-Duplex Net Weighers and Ideal Elevators — all illustrated and described in new No. 801 Catalog. Send for your copy today.

B. F. GUMP CO. 1344 So. Cicero Avenue, Chicago 50, Illinois

When inquiring check CP 5396 on handy form, pgs. 2-3

When Your Process Demands **FILTERING** **MIXING** **STORING**



LOOK FOR THESE FEATURES

PROVED, LOW-COST OPERATION
EASY TO CLEAN
DEPENDABLE, TROUBLE-FREE
PERFORMANCE
ALL SIZES AND CAPACITIES
LOW UPKEEP

Regardless of the size or type of your installation, whatever your process may be, there's an Alsop Filter, Mixer and Storage and Mixing Tank to "fit your job", you can be sure of getting from Alsop the right unit properly applied — you can depend on Alsop proved performance features. Alsop Filters, Mixers and Tanks are available in a complete range of sizes and capacities and Alsop Equipment is custom fitted to your application by engineers who have thorough experience in Filtration and Agitation. Look for the proved features and the benefits that Alsop Filters, Mixers and Tanks can bring to your processing operations. Write for full information, recommendations and quotations.

ALSOP
ENGINEERING CORPORATION

812 Alsop Square, Milford, Connecticut

When inquiring check CP 5397 on handy form, pgs. 2-3

PROCESSING

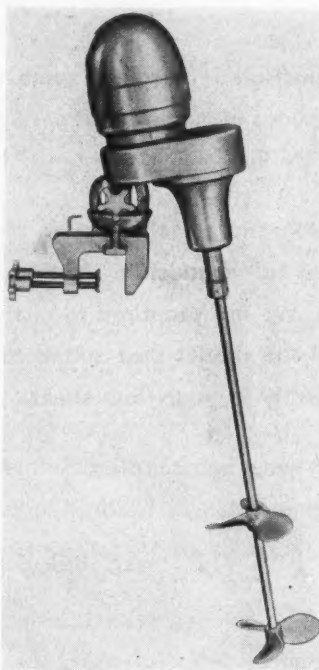
Easy to adjust length of mixer shaft . . .

portable 1/8-3 hp units clamp
directly on vessel

Uses: Portable mixers for clamping directly on barrel, drum, tank, or kettle.

Features: Shaft length is adjusted with one Allen screw. Mixer position is adjusted with a single hand-wheel (there is no wrench required). These portable mixers are standard and can be easily replaced.

Description: MixMor portable propeller mixers are available in



Portable mixer, gear-drive model

sizes from 1/8 to 3 hp. They are provided with shaft and balanced propellers of ordinary metals or stainless steel. Motors are drip-proof, totally enclosed, or explosion-proof where required.

(Product of L. H. Butcher Company, Dept. CP, 3628 E. Olympic Blvd., Los Angeles 23, Calif. . . . or for more information on manufacturer's product, reader may simply check CP 5398 on the convenient Reader Service slip located between pages 2 and 3.)

WHAT'S YOUR GRINDING PROBLEM?



If you're wondering how to crush, granulate, or pulverize some kind of material, maybe the same kind of a job or a similar one is already being done with our machines. Then the answer to your question is easy.

However, you may have an entirely new grinding problem. If so, we'd like to find the answer in our research and testing laboratories.

The functions of these laboratories are to conduct and evaluate pilot tests on materials in behalf of processors; to make short production runs on commercial-size machines; to develop and adapt machines for heretofore untried processes.

You are invited to communicate with us. Our knowledge and facilities may be of great value to you.



THE BAUER BROS. CO.

1728 Sheridan Ave.
Springfield, Ohio
Established 1878

When inquiring check CP 5399 on handy form, pgs. 2-3

MANAGER OF PRODUCTION

Firmly established process firm is seeking an operating man to direct its various multi-plant production activities. We desire a man with plant management experience in a batched processing operation such as cereals, chemicals, milling, distilling, or paint. Biochemical experience or knowledge desired, with Ch.E. or M.E. training. Age 30-40. Salary geared to your qualifications and level of this position. Your confidential, complete resume is invited if you have the above experience and training. Box 103, c/o Putman Publishing Company, 111 East Delaware Place, Chicago 11, Illinois.

**Little space needed
by dust collector**

Uses: Collecting and separating all manner of dry industrial dusts when gas temperature does not exceed 800°F and when shape and weight of dust particles are such as to make mechanical separation practical. Reported as excellent pre-cleaner for filters and electrostatic precipitators.

Features: Economical to install; needs a minimum of space.

Description: Single Dustmasters are available in diameters ranging from 18 to 84", with air flow capacities of 620 to 13,500 cfm (at 70°F and 2" H₂O pressure drop). Available in single, duplex, quadruplicate, and two-stage arrangements.

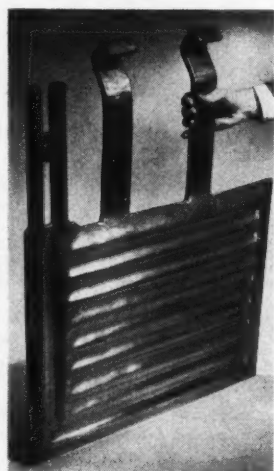


Shows action within collector

(Manufacturer is A. W. Banister Co., Inc., Dept. CP, 21 Charles St., Cambridge 41, Mass. . . . or check CP 5400 on handy form, pages 2 and 3.)

**Announce volume production
of lead plate heater . . .**

will be highly useful in many corrosive operations



Lead plate type heater

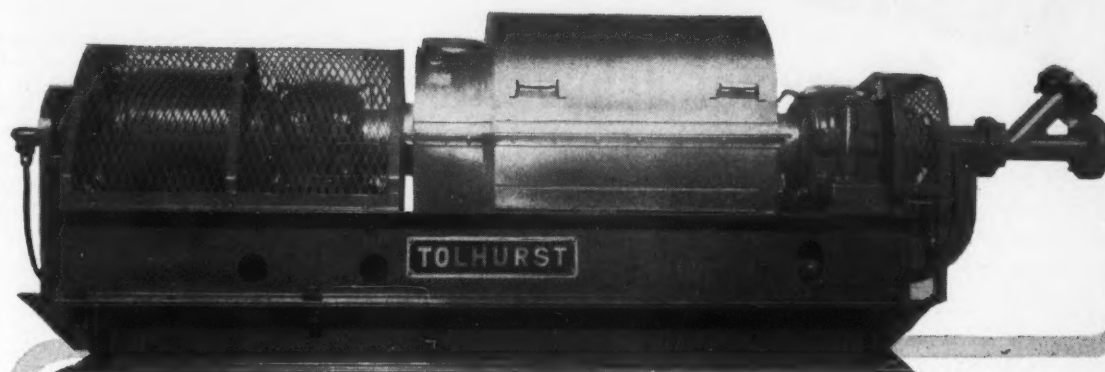
Uses: Plate type heater for use with 10 lb or less of steam.

Features: Made of lead for resistance to sulfuric, phosphoric, chromic and sulfurous acids, sulfates, and other corrosives. Units can be produced in volume, says manufacturer.

Description: Three standard sizes are available: 6.6, 9.9, and 13.2 sq ft of surface area. Special units for unusual working conditions can be designed, however.

(Made by Knapp Mills Inc., Dept. CP, 23-15 Borden Ave., Long Island City, N. Y. . . . or check CP 5401 on handy form, pages 2 and 3.)

can this **NEW** **CONTINUOUS CENTRIFUGAL** cut filtration costs for you?

**NOW YOU CAN GET
A CONTINUOUS CENTRIFUGAL THAT PROVIDES . . .**

- 7 different pool depths
- Variable beach speeds from 0 to 300" per minute
- 2000 F x G
- Self-cleaning feed chambers

WHAT CAN THIS MEAN TO YOU?

FOR LONG RUNS ON A SINGLE PRODUCT If your plant runs continuously on a single product, process fluctuations or changes in processing technique need no longer be a problem. The Vari-Beach Drive permits beach speed to be changed instantly, from 0 to 300 inches per minute. Seven different pool depths are available by a simple adjustment of the Vari-Pool Orifice Plates. An available force of 2000 times gravity assures maximum settling rate. This flexibility can mean maximum efficiency in your centrifuging step.

FOR SHORT RUNS ON DIFFERENT PRODUCTS Per-

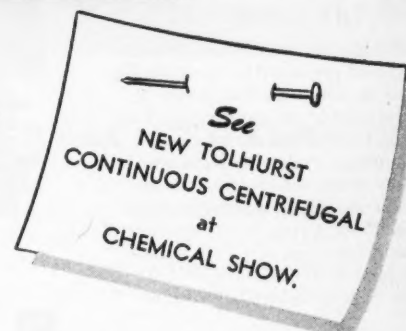
haps your plant runs for awhile on one product, then changes over to another product. Now, for the first time, you can enjoy the advantages of continuous centrifuging. When you change from one product to another, you simply adjust beach speed and pool depth by means of the Vari-Beach Drive and Vari-Pool Orifice Plates and you're ready for the new run. Self-cleaning feed chambers minimize down time when changing products.

FIELD TEST UNITS Ask for details on Tolhurst Continuous Centrifugal available for a 90-day test in your plant.

Tolhurst CENTRIFUGALS

Division of
AMERICAN MACHINE AND METALS, INC.
EAST MOLINE, ILLINOIS

When inquiring check CP 5402 on handy form, pgs. 2-3



Sharples has...

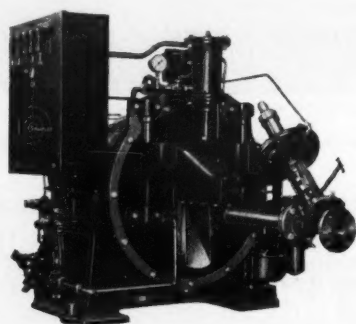
TWO RIGHT ANSWERS

for crystal dehydration

The proved answer to any crystal dehydration problem is found in one of these two Sharples centrifuges. An analysis of your particular requirements will lead to an unbiased recommendation as to the type of centrifuge most suitable—Sharples makes both.

IF YOU RINSE THE CRYSTALS

The Sharples Super-D-Hydrator is designed primarily for free draining crystals, where product purity or separation of the mother and rinse liquors are of critical importance. The continuous cyclic-operation may be easily controlled to adjust for any particular washing and drying conditions. Capacities on the larger C-27 model range up to 8 Tons per hour on some materials. Bulletin 1257 describes the Super-D-Hydrator.



IF YOU DO NOT RINSE THE CRYSTALS

The Sharples Super-D-Canter is used for dehydrating fine or amorphous-type materials. Where washing efficiency and final moisture content are not critical, the Super-D-Canter has decided economic advantages in capacities up to 3,000 lbs. per hour. The rate of liquid handling is substantially independent of the crystal concentration, and the Super-D-Canter operates continuously and efficiently without regard to changes in slurry concentration. Write for Bulletin 1254.



SHARPLES

THE SHARPLES CORPORATION • 2300 WESTMORELAND ST. • PHILA. 40, PENNA.
NEW YORK • PITTSBURGH • CLEVELAND • DETROIT • CHICAGO • NEW ORLEANS • SEATTLE • LOS ANGELES • SAN FRANCISCO • HOUSTON
Associated Companies and Representatives throughout the World

When inquiring check CP 5403 on handy form, pgs. 2-3

PROCESSING EQUIPMENT

**Rugged, shockproof construction
featured by reactors made
of polyethylene**

Uses: For treatment of highly active liquids such as fluoboric, hydrofluoric and organic solvents, and for use in ion exchange and separation of rare earths.

Features: "Poly Pup" reactors are shockproof and non-brittle. Constructed of polyethylene, they are streamlined for ruggedness and simplicity. Interior is easily accessible for inserting or removing contents and for cleaning. Reactors are said to have outstanding inertness to most chemicals.

Description: Units are available from 3.5 to 22.5" OD in heights of 16, 32 and 48" and custom sizes. Almost unlimited heights are available by using lengthener tubes. These light-weight reactors come complete with inlet and outlet tubes, gasketing, and mounting hardware for securing to floor.

(Product of "Poly Pup" Div., Enley Products, Inc., Dept. CP, 254 Pearl St., New York 38, N. Y. . . or for more information check CP 5404 on handy form, pages 2 and 3.)

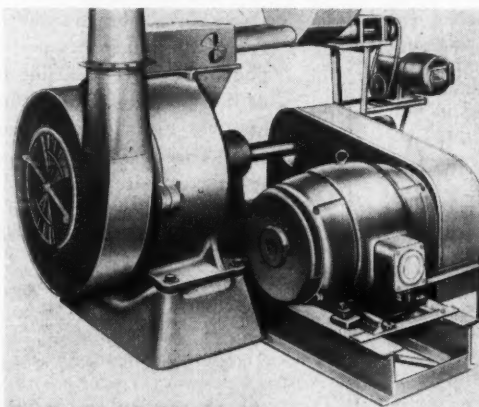
**Product from pulverizer
can be as small as
3 to 5 microns . . .**

but quick adjustment changes size to 20-80 mesh; handles fibrous, oily, or heat-sensitive feed

Uses: Grinding a variety of material types, including fibrous, brittle, or oily. Pulverizer has been used for polyvinyl chloride, DDT, whey, whole wheat grain, spices, crude glass, albumin, fungicide, fibrous talc, tobacco stems, beet sugar, cocoa, and dyestuffs, to name a few.

Product sizes attainable range from coarse (20 to 80 mesh) to ultra-fine (3 to 5 microns).

Features: Many heat-sensitive materials can be ground without refrigeration: accurate control of the air stream going through pulverizer makes it

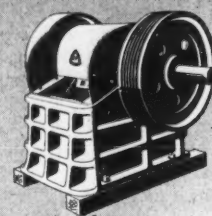


Pulverizer combines impact and air-attrition grinding actions, plus internal classification

DENVER EQUIPMENT



... NOTE THESE FEATURES ...

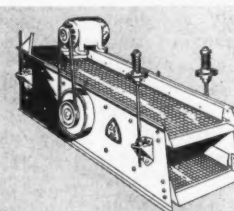


DENVER JAW CRUSHER

Size: 5" x 6" to 32" x 40".

Features: Steel Frame, anti-friction bearings, Manganese steel liners.

Price examples,	5" x 6"	\$ 581.00
less drives.	8" x 10"	1375.00
FOB Denver.	10" x 16"	2211.00

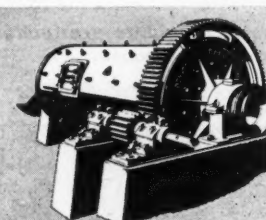


DENVER-DILLON VIBRATING SCREEN

Size: 1' x 3', to 6' x 14'; 1, 2, 3 or 4 decks.

Features: 2 bearing drive, low H.P., all steel construction.

Price examples,	2' x 4'	\$ 600.00
less drive and screen	3' x 6'	1155.00
cloth, Double Deck.	4' x 8'	1870.00
FOB Denver.		



DENVER STEEL HEAD BALL MILL

Size: 30" x 18" to 6' x 24".

Features: Cast steel heads, cut tooth gears, protected trunnion bearings and manganese steel liners.

Price examples,	30" x 36"	\$1195.00
with liners, less drive	4' x 4'	5156.00
and ball charge.	5' x 6'	7986.00
FOB Denver.		



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LONDON, JOHANNESBURG.

When inquiring check CP 5405
on handy form, pgs. 2-3

CHEMICAL PROCESSING

possible to produce sub-sieve particles and yet maintain grinding temperature below 125 to 130°F. For extreme requirements, jacket chilling or heating is available.

Grinding chamber can be completely disassembled in ten minutes for quick clean-up or maintenance. Liner can be changed to handle different materials.

Description: The Superfine pulverizer is based upon the use of centrifugal force and air currents to grind by shear and impact, with simultaneous internal classification and recycle of oversize. It is made in five sizes: 10-15, 20-30, 30-40, 40-50, and 60-100 hp. Capacities are from 50 to 5000 lb/hr of finished product, depending on mill size, size and type of material fed, and fineness desired.

(Developed by Schutz-O'Neill Company, Dept. CP, 319 Portland Ave., Minneapolis 15, Minn. . . or check CP 5406 on handy form, pages 2 and 3.)

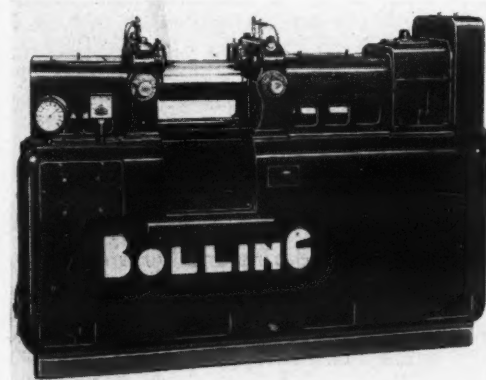
All of lab mill except rolls is fully enclosed . . .

large universal joints provide wide roll opening and eliminate outside connecting gears

Uses: Designed for experimental work on rubber or plastic materials.

Features: Rolls are driven by large universal joints, permitting an unusually wide roll opening and eliminating external connecting gears. All parts, other than working faces of rolls, are enclosed.

Description: Mill has two 6" diam by 13" face chrome-plated rolls. The roll bearings are Timken anti-friction with full-flood lubrication system. Fully enclosed splash-lubricated gearing in drive stand is cut helical to reduce noise and vibration to practically



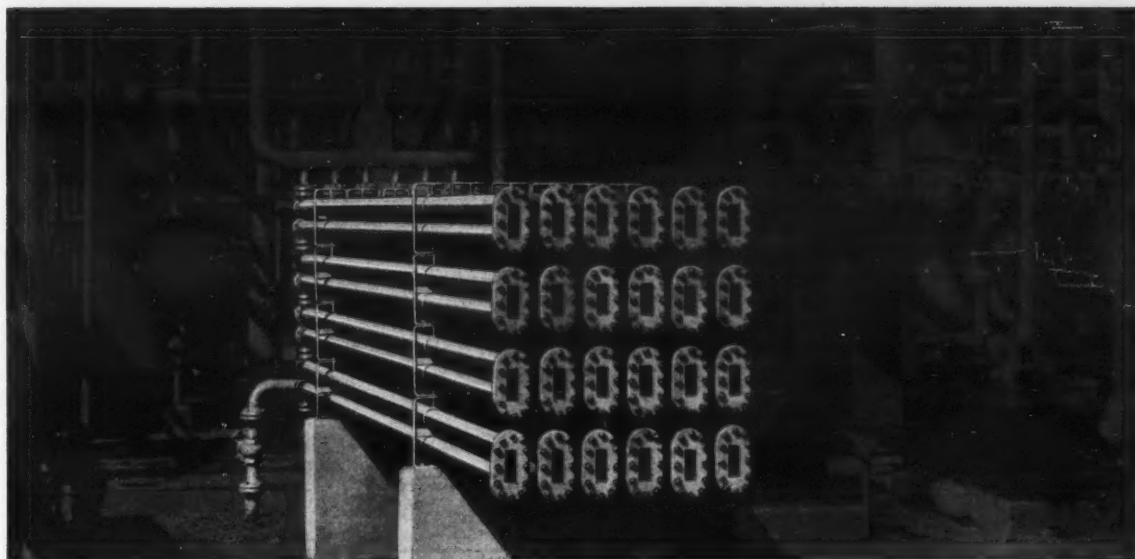
Two-roll lab mill

nothing. Piping for steam or water is built in; controls are convenient for operator. Drive is by 7½ hp gearmotor with disc type brake and starter.

(Ultra Laboratory Mill is a development of Stewart Bolling & Co., Inc., Dept. CP, 3190 E. 65th St., Cleveland 27, Ohio . . . specify CP 5407, pgs. 2 & 3.)

Eliminate Down-Time

in your plant with



BROWN FINTUBE Sectional HEAT EXCHANGERS

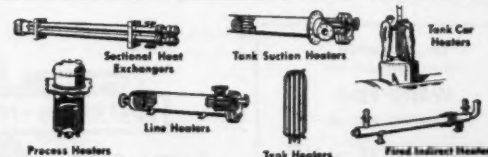
● Simply manifolding an extra parallel stream into a bank of Brown Fintube Heat Exchanger Sections, permits one group of sections after another to be taken off-line, and cleaned, while the rest of the unit — always thoroughly clean — carries the exchanger's full rated capacity, year after year, without shut-downs.

This avoids the necessity of carrying a 100% standby unit, to assure continuous operation, as when a "bundle" type heat exchanger is used. It permits the sections to be cleaned as frequently as the duty requires without affecting other parts of the plant. It avoids the loss in efficiency that results from just a few thousandths of an inch of deposit on the tubes; and assures clean surfaces and highly efficient operation at all times.

Eliminating down-time is only one of Brown Fintube's many advantages. Flexibility to meet changing plant requirements; reduced fouling; and prompt delivery are some of the others. Bulletin No. 512 contains full details; and will give you many proven, money-saving ideas! Send for a copy.



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Elyria, Ohio



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When inquiring check CP 5408 on handy form, pgs. 2-3

BUFLOVAK-DOPP PROCESSING KETTLES

**Serve Many Industries with
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Modern BUFLOVAK-DOPP Processing Kettles are a vital part of many processes in the Chemical and Food Industries. They successfully perform a number of basic operations; such as, heating, cooling, mixing, extracting, reacting, distilling, evaporating, drying, and solvent recovery.

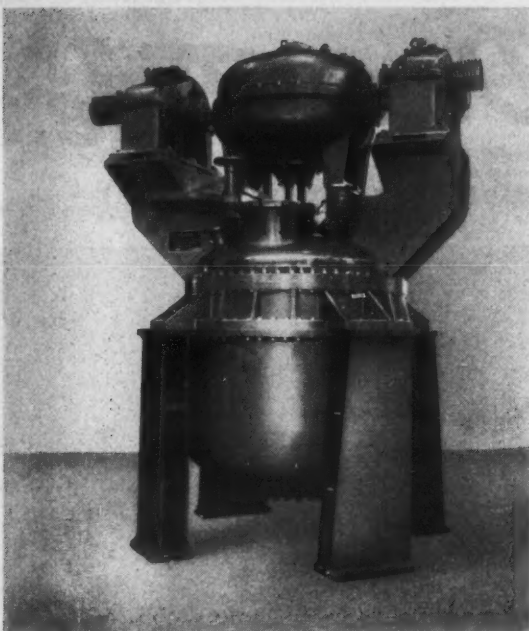
Many operations can be progressively performed in the same unit; thereby speeding up production, lowering investment cost, and increasing profits!

Other profit-building features are new and improved types of Agitators that give great savings in production time.

Whether you are in need of new equipment or possible improvements in your present process methods, you will find many helpful suggestions in our new Processing Kettle Catalog No. 356. Send for a copy.

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BUFLOVAK 630-gal. Jacketed Drying and Fusion Kettle with Double Motion Agitator. Molten salt gives high temperature, low-pressure operation. The sweep and paddles on the double motion agitator are separately driven by 50 H.P. motors. This permits varying the speed of each, independent of the other, to best meet the agitation requirements of the product.

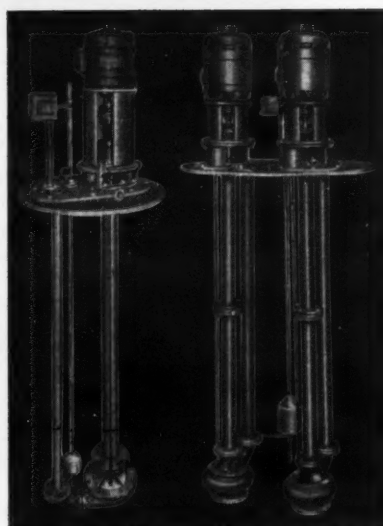
When inquiring check CP 5409 on handy form, pgs. 2-3

GET NON-CLOG PUMP PERFORMANCE at "ordinary" pump prices—with the AMERICAN-MARSH NKS vertical wet pit pump

Now — at no more than the cost of ordinary pumps — you can get full non-clog performance with the American-Marsh NKS! On vertical wet pit applications, the NKS delivers remarkably high efficiency, handling clear liquids or liquids with solids up to three inches in diameter.

You'll also find it extremely versatile in application. You can get both single and duplex models with wetted parts furnished in standard iron, bronze or special alloys. Numerous items of optional equipment further increase adaptability to special requirements.

The NKS Pump is moderately priced . . . and like every American-Marsh Pump, receives a complete operating test before shipment. So when you specify sewage and sump pumps, be sure you get the extra performance American-Marsh Pumps deliver . . . at no extra cost!



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Models from 25 to 800
GPM at heads from 10
to 60 feet.

When inquiring check CP 5410 on handy form, pgs. 2-3

THE HANDBOOK OF SOLVENTS

Reviewed by Frank E. Dolan

Manager, Market Development Department

Commercial Solvents Corporation

This handbook, by Leopold Scheffan, Ph.D. and Morris Jacobs, Ph.D., is a useful contribution to the field of chemical reference books since it has collected under one cover a considerable amount of information on organic solvents which previously had to be obtained from many sources. The first 10% of the book is devoted to a discussion of various theoretical and practical aspects of solvent behavior, solvent recovery, and the safe handling of solvents in industry. This section is very well written and covers a vast amount of theory in concise, easily understandable language. The discussion of hazards and what to do about them is excellent, especially the tabular presentation of data on maximum allowable vapor concentrations. This table gives for each of a large number of commercially important solvents, several values for the M.A.C. as recommended by various states and organizations. The only criticism of this first section is that it places too much emphasis on data important only to the protective coating industry, but the authors can probably justify this on the basis that organic coatings represent the largest single use for solvents.

The second section, representing 90% of the book, gives physical properties of about 2700 organic liquids which are being, or might be, used as solvents. While the data presented will undoubtedly be highly useful to most readers, more information on what materials these liquids will dissolve, who manufactures them, and their availability — commercial, semi-commercial, experimental, or not available at all — would increase the value of the table to industrial chemists and chemical engineers.

To obtain "The Handbook of Solvents" remit \$10 direct to D. Van Nostrand Company, Inc., Dept. CP, 250 Fourth Ave., New York, N. Y. When inquiring specify CP 5411 on handy form, pages 2 and 3.

Condensed Pyridazine and Pyrazine Rings

Reviewed by R. L. McKee

Department of Chemistry

The University of North Carolina

As indicated in the title, this volume by J. C. E. Simpson, deals largely with the systematic chemistry of cinnolines, phthalazines, and quinoxalines. In addition, compounds in which the above systems have been fused with carbocyclic or heterocyclic systems is included. The systems considered are:

1. Cinnolines.
2. Cinnolines containing additional fused rings. Benzo[c]cinnoline, benzo[g]cinnoline, ben-

zo[h]cinnoline, dibenzo[f,h]cinnoline, benzo[f]naphtho[2,1-c]cinnoline, diphenanthro[9,10-c, 9',10'-c] pyridazine.

3. Cinnolines containing bridged rings.
4. Cinnolines containing fused heterocyclic rings. Pyrrolo-, furano-, thiopheno-, pyrazolo-, pyridazino-, and triazolo- cinnolines and dipyrimido[5,4-c,4',5'-e]pyridazine.
5. Phthalazines.
6. Condensed phthalazines. Benzo- and dibenzo-phthalazines, naphtho- and dinaphtho-phthalazines, indeno[1,3-de]phthalazine, benzimidazo[2,1-a]phthalazine, pyridazo[4,5-c]phthalazine, xanthano [9,1-c,d]-pyridazine, tetrazalo[a]phthalazine, certain more highly condensed phthalazines, and the azaphthalazines.
7. Quinoxalines.
8. Condensed quinoxalines. Benzo-, dibenzo-, cyclopentano-, indeno-, and acenaphtho-quinoxalines, pyrrolo-, indolo-, pyrido-, pyrazolo- (flavazoles), imidazolo-, triazolo-, and pyridazo-quinoxalines, and 5-aza- and 5,8-diazaquinoxaline (5,7-diazaquinoxaline, pteridine, is to be treated in another volume).

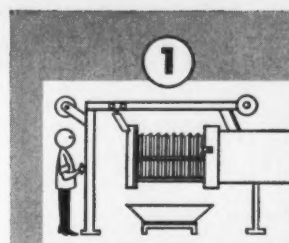
In tabular form in three appendices are to be found ultraviolet absorption spectra of cinnoline and quinoxaline derivatives, basic strengths of cinnoline, phthalazine, and quinoxaline derivatives, and antibacterial and parasitocidal activity of cinnoline and quinoxaline derivatives.

In the preface, it is made clear that "this book has been written with the objective of insuring continuity with, and expansion from, Meyer-Jacobson's *Lehrbuch der Organischen Chemie*, Volume II, 3." Hence, in this volume, the treatment of cinnolines and phthalazines is exhaustive, while in recognition of the considerable chemistry of quinoxalines known at the time of publication of the *Lehrbuch*, the latter are presented as a coherent unit but with particular attention being focused on the work done since 1917.

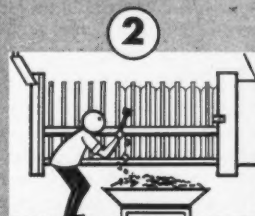
This volume is complete, up-to-date, and, in the opinion of the reviewer, unusually well written.

To obtain "Condensed Pyridazine and Pyrazine Rings" remit \$12.50 direct to Interscience Publishers, Inc., Dept. CP, 250 Fifth Ave., New York 1, N. Y. When inquiring specify CP 5412 on handy form, pages 2 and 3.

For a quicker method of
converting from one viscosity scale
to another, see page 192



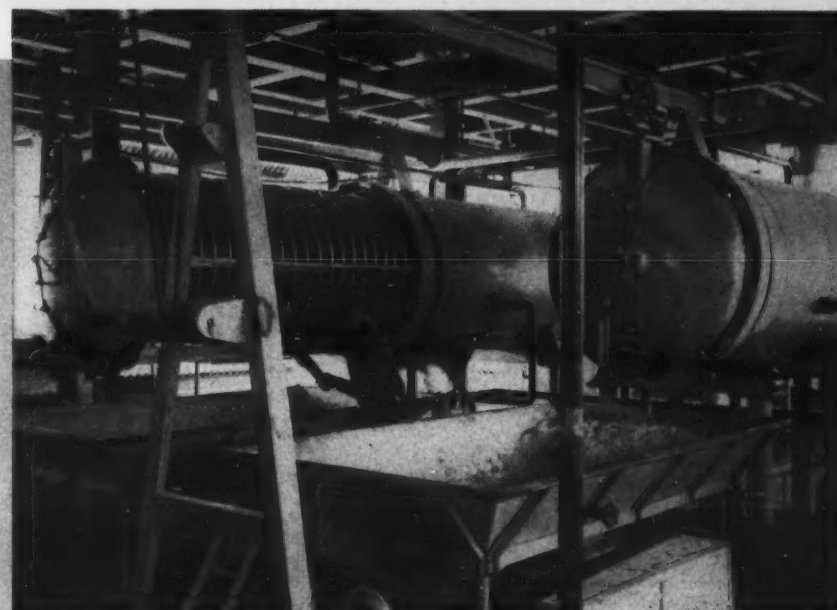
One motion unlocks the quick-opening filter cover. The all-metal leaves roll out of the filter as a unit.



Operator taps leaves to drop cake into trough, hopper or wagon for recovery or disposal.



Then he returns clean leaves into filter. The cover locks pressure-tight with one swift motion.



Large-capacity filter is easy to clean between cycles

One man can open this filter, dump the cake from it, and close it again—in about ten minutes!

That's one reason why the Niagara Style "H" Filter can cut your costs on large liquid filtration and solids recovery applications.

Niagara can now offer you both vertical and horizontal pressure-leaf filters, with unit sizes from 20 to 1500 square feet. If you are a big user of filtration, you'll want all the facts on what these filters can do for you. Just write or mail the coupon today.

LARGE CAPACITY—The Style "H" Filter delivers high-clarity filtrate at rates up to 45,000 GPH. Sizes range up to 1500 sq. ft. of working filter area in one compact, leak-proof unit.

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cated design, you can have the Niagara Filter in stainless steel and other alloys, for corrosion resistance, at low cost. Special linings are available, too.

EXCELLENT CAKE-WASHING CHARACTERISTICS—Almost true displacement washing.

JACKETING IS NO PROBLEM, EITHER—The filter shell can be readily jacketed for heating or cooling at minimum additional cost.

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City _____ Zone _____ State _____

When inquiring check CP 5413 on handy form, pgs. 2-3

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You don't have to baby this machine

The Oster No. 422 Power Vise Stand will do the job when and where you want it because it's fast, dependable, and sturdy. It's easy to operate, easy to move, and threads all pipe sizes up to 2".



The answer to maintenance threading

The Oster No. 502 "Pipe Master" with standard range from 1/2" to 2" and extra range of 3/8" to 3/4" is a heavier, faster machine than the No. 422. Ideal for shop maintenance, it turns out quality threads under rough conditions.

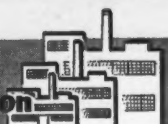
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1893 • CELEBRATING 60 Years Leadership in the Threading Industry • 1953

When inquiring check CP 5414 on handy form, pgs. 2-3

Expanding Chemical Production



Another "traveling lake" is in the making

A \$3,000,000 mine and plant for production of Ilmenite will be constructed for Du Pont near Lawtey, in north central Florida. Processed ore will be shipped to plants at Baltimore and Edge Moor, Delaware for conversion into titanium dioxide pigment and into titanium metal.

Company expects to have it in operation by early 1955. A dredge will float on a "traveling lake" about half a mile long and 500 feet wide. Sand will be sucked in at the front of the barge, scrubbed to remove organics, and processed to separate Ilmenite from the white sand. Rejected sand will be poured out at the back of the lake so the lake actually moves. Novel separating equipment makes this project commercially feasible even though only 2 per cent of the sand mined is recovered as Ilmenite: in other "diggings" Ilmenite runs as high as 75 per cent.

Fertilizer plant a-building in Ohio, set production soon

American Agricultural Chemical Co., New York, is completing fertilizer plant at Cairo, Ohio. The plant includes a 24,300 sq ft standardized wet-mix steel building and an additional dry-mix building.

More titanium dioxide pigments slated from Georgia plant

A new American Cyanamid plant for manufacture of titanium dioxide pigments at Savannah, Ga., will be built by Chemical Construction Corp. The plant will be operated by the Calco Chemical Div., American Cyanamid Co.

Hardwood pulp plant in pilot stage

Rust Engineering Company has completed a pilot plant for the New York and Pennsylvania Company, Inc. New plant, at Lock Haven, Pa., was designed to make use of Pennsylvania hardwoods for high grade paper pulp. Pilot plant will also be able to use local softwoods.

This experimental project is housed in a 2-story concrete and cement block building. It will have its own wood handling system, pulp mill, and bleach plant. Design also permits it to be integrated with company's two paper mills and pulp mill on the site.

Furfuryl alcohol shipments begun at Memphis

A \$600,000 vapor-phase hydrogenation plant at Memphis, Tennessee is starting production. The Quaker Oats addition (to their furfural plant there) will produce furfuryl alcohol by a catalytic process. By-product hydrogen is being piped in from a nearby plant.

Useful in resins, adhesive additives, and as a dye solvent, furfuryl alcohol will be available in tank-car lots.

Government OK's construction of ammo plant in Wisconsin

Construction of a government-owned plant at the Badger Ordnance Works, Baraboo, Wis., for production of smokeless powder has been authorized by the office of the Secretary of Defense.

Most of the manufacturing process will be conducted under water for added safety. The method is reported to be several times faster than is conventionally employed. The plant will be operated by the Liberty Powder Defense Corp., a subsidiary of Olin Industries, Inc.

Tar products will undergo study in new research lab

Purchase of a 2-acre site at its Verona, Pa., research center for additional facilities of its tar products has been announced by the Koppers Company, Inc. The one-story building is expected to be completed by late spring of next year to house service and testing laboratories of the firm's Tar Products Div.

Increase output of tricresyl phosphate by 80 per cent at Monsanto

Monsanto Chemical Co. has completed production changes to increase its tricresyl phosphate output more than 80 per cent, it has been recently announced. The material is being used both as an additive to gasoline and as a plasticizer in production of vinyl floor tile, wire compound and film.

\$2 million facilities added

A \$2 million addition to their Memphis, Tenn. plant has been completed by the Velsicol Corp. for

production of chlorine, liquid caustic, hydrogen gas and bleach. The new unit will produce some 88,000 lb of liquid chlorine and 110,000 lb of caustic soda daily.

Synthetic pyridine plant goes on line in Wisconsin for pharmaceuticals

Production has begun at Ansul Chemical Company's synthetic pyridine plant at Marinette, Wis. Early production includes several hundred thousand lb of refined pyridine, alpha-picoline, gamma-picoline, 2 methyl 5 ethyl pyridine, beta collidine and a mixture of alkyl pyridine high boilers. Chief market for the pyridine derivatives is expected to be the pharmaceutical industry. Other end product uses are solvents, insecticides, corrosion inhibitors, dyes and plastics.

Textile mill facilities expansion will produce more tire cord

Ground was broken this summer by the United States Rubber Company for a major expansion of its textile mill in Shelbyville, Tenn. for increased production of tire chafer fabric, tufting yarns and rayon tire cord. Production is expected to start early next year.

Begin construction of new facilities for furnace black output

Continental Blacks, Inc. is constructing a plant at Ponca City for manufacture of 40 million lb annually of high abrasion furnace black. The unit is expected to be completed early next year. Output will be marketed by Witco Chemical Co.

Plan research lab for paint study near Pittsburgh area

New research laboratories are being constructed for the paint division of the Pittsburgh Plate Glass Company at Springdale, Pa., about 14 miles from downtown Pittsburgh. The building is expected to be ready for occupancy within a year.

US starts manufacturing its own spun-dyed rayon staple

First production of spun-dyed rayon staple in this country was begun recently by the Courtaulds, Inc. new plant in Mobile, Ala. Heretofore, all of the firm's spun-dyed rayon sold here has been imported from England where it was produced by Courtaulds, Ltd., the parent company which originated the product.



background photo courtesy of Shell Oil Company

J-M CHEMPAC—an asbestos-Teflon packing that withstands virtually ALL chemicals

THIS NEW Johns-Manville development combines the sealing action and heat-resistant characteristics of asbestos with the all-around chemical resistance of Teflon. Its base is strong, resilient asbestos fibers thoroughly impregnated with chemically inert Teflon.

The versatility of Chempac greatly reduces the number of packing styles needed for chemical equipment. Stocking presents no problem because its inert ingredients do not deteriorate.

Chempac can be recommended for packing pump rods or shafts, valve stems, agitator shafts, expansion joints, rotary filters and similar apparatus. It is outstanding in service against many acids, alkalies, caustic solutions,

and solvents, at temperatures to 525° F.

Chempac Packing is available in coil, spiral and ring form for rod, plunger and valve stem service. Style Nos. 2011, 2012 and 2013 are made of white Canadian Chrysotile Asbestos. No. 2014 is made of blue African Crocidolite Asbestos. Johns-Manville also makes Chempac Gaskets, Nos. 117 and 138 of plies of asbestos cloth treated with Teflon.

Your Johns-Manville Packing Distributor can help you select the right Chempac Packing or Gasket for your application. For complete information write him or Johns-Manville, Box 60, New York 16, N. Y. In Canada, 199 Bay Street, Toronto 1, Ontario.



Johns-Manville PACKINGS & GASKETS

When inquiring check CP 5415 on handy form, pgs. 2-3



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When inquiring check CP 5416 on handy form, pgs. 2-3

Absence of Inner Columns in Building

FACILITATES BOTTLE STORAGE



Very favorable appearance is presented by 60' wide, 180' long building

Economical and speedy construction, versatility, and minimum maintenance are among advantages of warehouse recently placed in service at Norwich Pharmacal Company

Problem: In pharmaceutical manufacturing it is necessary to carry a large stock of empty bottles to insure a continuous supply. At The Norwich Pharmacal Company in Norwich, N. Y., additional warehouse space was needed for bottle storage. A building was desired that would provide the room required in a short time and fit in with plans for possible future expansion.

Solution: Since a prefabricated steel building, 32' wide and 180' long had given satisfactory service for several years for storage of certain raw materials and machine parts, it was decided that another building of this type would fulfill the need for additional bottle storage facilities. Accordingly, the building shown in accompanying photographs was constructed. It is 60' wide and 180' long. Total height to the eaves is 16', including a two foot concrete wall, and 14' of siding. Buildings are available in any size desired.

Galvanized bolts, with Neoprene washers, securely

**construction
and maintenance**



Design of building makes entire floor area available for palletizing

fasten the ribbed metal sheets to the steel framework. Pre-engineered construction of these metal buildings assures strength without need for support in interior. Where metal sheets meet the base and at the windows, corrugations are tightly crimped to provide a snug fit and guard against entrance of snow, moisture, rodents, or vermin. Trim, die-formed eave sheets are bolted to roof sheets to insure weather-tightness. Sidewall sheets are mitered at end of roof under eave. Heavy gage steel ventilators are of cone and ring construction. Rigid frame is engineered for maximum strength per pound of steel, eliminating need for columns or pillars.

Results: Steel building was constructed in about one month. That includes the wiring and all the inside work, but not the footings which took two weeks before the steel started going up. Norwich is particularly pleased with the design due to the fact that there are no inside columns in the building. This allows complete use of floor space for palletizing. Other advantages found for building include economical construction, attractive appearance, minimum maintenance, and versatility. Changes in it can be made easily and fast. It can be divided for manufacturing and added to for more warehouse space.

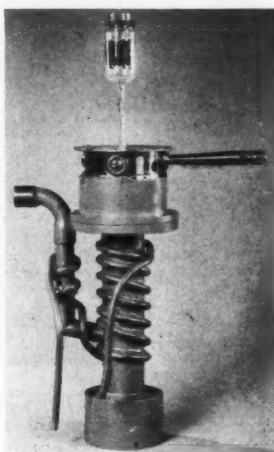
(Pre-engineered buildings are a product of Butler Mfg. Co., Dept. CP, 1283 Eastern Ave., Kansas City, Mo. . . or for more information check CP 5417 on handy form, pages 2 and 3.)

**Major conversion unnecessary
when installing pump, valve,
and port assembly . . .**

unit adapts to most commercial rotary exhaust machines in use in electronic tube industry

Compact, high-vacuum conversion pumping unit of large capacity for use with conventional rotary exhaust machines in the electronic tube industry has been announced by manufacturer.

Unit is designed specifically to evacuate standard electron tubes. However, it can also be used to pump other relatively small volume containers such as hermetically sealed relays, vials, instrument control elements, and vacuum condensers. For evacuating larger volume vessels or when back-filling operations are desired, a modification of the unit will permit small solenoid valves to be incorporated. This allows inclusion of a "roughing" stage in the cycle, practically eliminates pump oil deterioration and loss, and provides a simple means for introducing measured amounts of gases into the evacuated vessel.



Modification permits evacuation of larger volume vessels

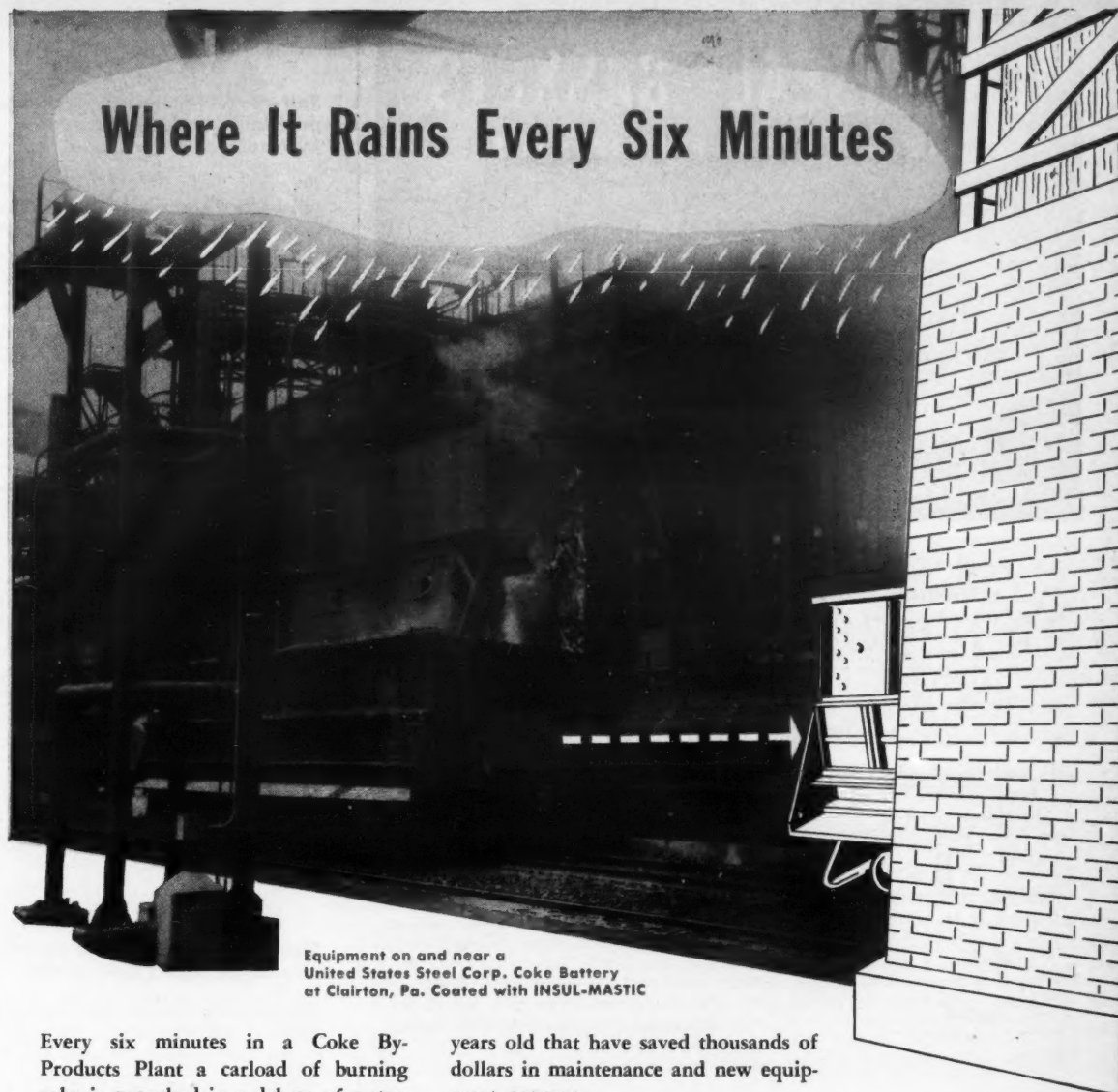
Since the MB-10 Pump, Valve, and Port Assembly has a high forepressure tolerance of 400 microns, need for major conversion changes in installations of this equipment is eliminated. Pump will operate through most standard sweep and sliding valve combinations.

Unit operates at a pumping speed of 10 liters/sec, between 0.1 and 10.0 microns Hg. It also offers an ultimate pressure of 1×10^{-4} mm Hg, a limiting forepressure of 0.5 mm Hg, and an ultimate vacuum of 5×10^{-5} mm Hg which provides a wide performance range for overall flexibility of application. Dimensions of unit are: height, 6-3/8"; length, 7-11/32"; width, 2-11/16". Net weight is 1.3 lb.

Need for air or electrically operated valves to control evacuation cycle through "tube loading" and "pumping" stages is eliminated on this equipment by positive action of mechanically operated valve assembly which is specifically designed for small vessel application.

(Product of Consolidated Vacuum Corp., subsidiary of Consolidated Engineering Corp., Dept. CP, 735 Ridge Rd. W., Rochester 3, N. Y. . . . or for more information check CP 5418 on handy form, pages 2 and 3.)

Where It Rains Every Six Minutes



Equipment on and near a United States Steel Corp. Coke Battery at Clairton, Pa. Coated with INSUL-MASTIC

Every six minutes in a Coke By-Products Plant a carload of burning coke is quenched in a deluge of water. Clouds of steam rise from the car causing a corrosive industrial atmosphere. Corrosion was severe until steel mills and chemical companies began to coat their metal equipment with INSUL-MASTIC. Now, some of these companies can show you applications several

years old that have saved thousands of dollars in maintenance and new equipment expense.

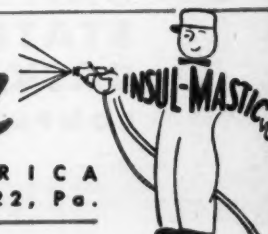
Acids, alkalis, rain and sun will not appreciably shorten the life of the heavy INSUL-MASTIC Bituminous Coatings. Years after they have paid for themselves they will still prevent corrosion. They also Vaporseal Insulation, Waterproof and Insulate.

For a neat looking plant, resurface old masonry buildings with INSUL-MASTIC and Colored Stone Granules.

Think
First
of the
Coatings
that Last!

Insul-Mastic

CORPORATION OF AMERICA
Oliver Building • Pittsburgh 22, Pa.
Representatives in Principal Cities

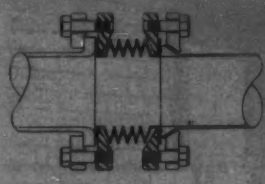


When inquiring check CP 5419 on handy form, pgs. 2-3

CHEMISEAL GASKETS

AND ACCESSORIES FOR GLASS PIPE

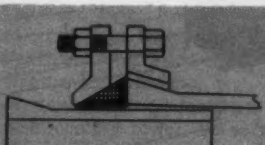
IMPERVIOUS TO ACIDS, CAUSTICS, SOLVENTS



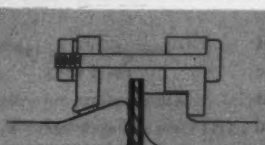
(Above:) Chemiseal Snap-on Gaskets, No. 820. Molded to match contour of conical-end glass pipe, they center automatically. For all standard pipe sizes from 1/4 in. to 6 in. (At left:) Chemiseal Expansion Joints, No. 212 for use where thermal expansion, vibration or misalignment requires flexible pipe section. Sizes 1 to 12 in. I.P.S.



Chemiseal Teflon-jacketed, neoprene or compressed cork Gaskets, Types T6N or T6-300 are standard for Corning conical flanges, seal at unusually low bolt load.



Chemiseal Jacketed Slip-Joint Gaskets (Teflon Jacketed Neoprene) provide positive, chemical-proof seals with low bolt loads. Made for standard pipe sizes from 1 in. to 6 in.



Chemiseal Adaptors No. 2-CRS, provide a tight, safe seal between glass coated steel or similar nozzles, and vessels of glass-lined steel, porcelain, Havel, etc. Easy to handle, single units—these adaptors combine a steel bearing ring for rigidity and a resilient core for perfect seal, both contained in a chemically inert Teflon Jacket.

UNITED STATES GASKET COMPANY

FLUOROCARBON PRODUCTS DIVISION
FABRICATORS OF "TEFLON" "KEL-F"
AND OTHER FLUOROCARBON PLASTICS
CAMDEN 1, NEW JERSEY



*DuPont's trademark for its tetrafluoroethylene resin

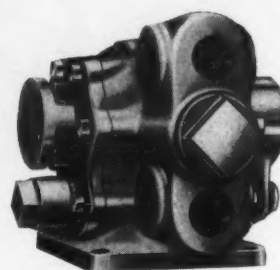
When inquiring check CP 5420 on handy form, pgs. 2-3

CONSTRUCTION & MAINTENANCE

Self-contained valve mechanism positions double-acting hydraulic cylinders

Four-way hydraulic valve provides a simple and reliable self-contained valve mechanism to position double-acting hydraulic cylinders, or hydraulic motors. It is used on hydraulic lifts, mining machinery, power tools, and for other single-purpose applications.

Valve has a design pressure of 300 to 1500 psi. Capacity is approximately 400 gpm at 1500 psi. It is not suitable for pressures over 1600 psi. Operating



Unit has capacity to 400 gpm at 1500 psi

fluid of valve is No. 10 S.A.E. motor oil or hydraulic oil of equal viscosity. A separate pump is needed to supply oil at required pressure. Unit has a special cast alloy body and a rotary valve. Check and relief valves and seats are of special hardened stainless steel alloy. Operating lever is furnished by user to suit individual requirements. Rotary valve has ball bearing construction. Net weight of unit is 35 lb.

(Type 555-RO valve is a product of A. W. Cash Co., Dept. CP, Decatur, Ill. . . . or for more information check CP 5421 on handy form, pages 2 and 3.)

Strength with minimum shrinkage offered by nylon filter cloths

Manufacturer has announced a line of nylon filter cloths (#4750) which offer advantages of high tensile and bursting strength, long life and minimum shrinkage. Cloth is said to have proved successful as strainer and as backing cloth on continuous rotary vacuum filter presses. Designed to be used in place of regular 10 ply cotton cloth, it is available in sizes up to 90" wide and in any length desired.

(Product of Robert Brautigam Sons, Dept. CP, Roebing and N. Tenth St., Brooklyn, N. Y. . . . or for more information check CP 5422 on handy form, pages 2 and 3.)

Report equipment value of \$18,500 replaced by one drill with adjustable blades

Uses: Drill finds best application on regular drill presses or radials, where its balanced cut produces accurately sized holes, but it can also be used on horizontal boring mills or vertical jig borers to rough out metal faster than a single point boring bar.

Features: Value of solid drills that this tool replaces is said to be over \$9500. In addition, it will

RAIN or SHINE



NO WATER SHORTAGE AT THIS PLANT

Dependable gravity helps provide the constant, uninterrupted water supply that all plants require for general service and fire protection. The 50,000-gallon Horton® ellipsoidal-bottom elevated tank shown above utilizes this natural law to provide water for plant operations and fire protection of the Diamond Alkali Company's Houston, Texas plant.

Horton elevated steel tanks with ellipsoidal-bottoms are available in standard capacities from 15,000 to 500,000 gallons. Horton elevated tanks with radial-cone bottoms are built in standard sizes from 500,000 to 3,000,000 gallons. For quotations on steel tank installations, please write our nearest office.

CHICAGO BRIDGE & IRON COMPANY

Atlanta 3	2107 Healey Bldg.
Birmingham 1	1533 North Fifth St.
Boston 10	1007-201 Devonshire St.
Chicago 4	2116 McCormick Bldg.
Cleveland 15	2212 Midland Bldg.
Detroit 26	1535 Lafayette Bldg.
Houston 2	2151 C & I Life Bldg.
Los Angeles 17	1536 General Petroleum Bldg.
New York 6	3314-165 Broadway Bldg.
Philadelphia 3	1650-1700 Walnut St. Bldg.
Pittsburgh 19	3208 Alcoa Bldg.
San Francisco 4	1545-200 Bush St.
Seattle 1	1307 Henry Bldg.
Tulsa 3	1649 Hunt Bldg.

When inquiring check CP 5423 on handy form, pgs. 2-3

CHEMICAL PROCESSING

cut oversize for clearance or undersize for press fits, taking the place of another \$9000 worth of special reamers.

Description: Drill is adjustable. It can cut any size hole from 2 to 3" with one set of blades, and any size from 3 to 4" with another set of blades.



Drill at left is in extreme extended position, while one at right, with smaller blades, is shown in its extreme contracted position

A scroll ring engaging bottom sides of blades performs double function of adjusting blades and supporting them against thrust of cut.

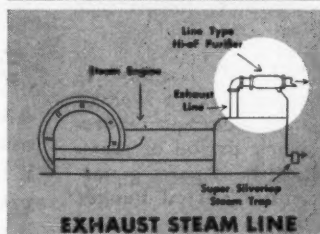
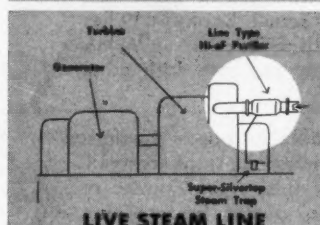
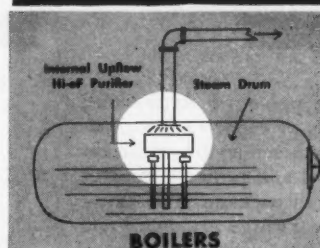
Body of drill is made of heat-treated alloy steel, and blades are made of high speed steel. Carbide tipped blades are available. Shank is #3 Morse, and overall length is 8". Blades can be furnished to produce stepped holes, round corners, flat bottoms, etc.

(Adjustable drill is a product of Hayden Twist Drill Co., Dept. CP, 8626 Lyndon Ave., Detroit 38, Mich. . . or for more information on manufacturer's product, reader may simply check CP 5424 on handy form located between pages 2 and 3.)

Variable speed motors used to improve production

Completely revised and amplified 16-page bulletin, lithographed in multi-colors, outlines several reasons why variable speed motors can be used to improve production. It includes 80 colored illustrations of motors, mechanical features, and remote control plus detailed data and specifications on the units pictured.

Bul 1797 is available from U.S. Electrical Motors, Inc., Dept. CP, Box 2058, Los Angeles 54, Calif. When inquiring reader may simply specify CP 5425 on handy Reader Service slip located between pages two and three.)

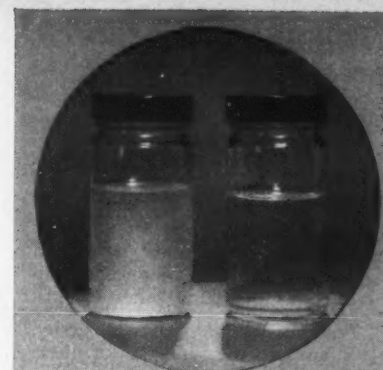


with Hi-eF PURIFIERS On the Job!

Clean steam means cheap steam and every engineer should consider the following uses of Hi-eF Purifiers:

- (1) In boilers to keep steam clean, dry and hot . . . to stop carryover and permit boilers to be operated at higher capacities.
- (2) Ahead of turbines, reciprocating engines, regulating valves and other costly steam equipment which eliminates any possibility of damage by slugs, entrained moisture, and scale.
- (3) In exhaust steam applications to remove objectionable entrainment so the steam may be used profitably for heating, processes or even returned to the boiler as condensate.

Hi-eF Purifiers are the best buy in separating efficiency today. They involve a new two-stage centrifugal design proved far more effective than conventional separators in actual field tests. Every purifier carries a 99% entrainment removal guarantee. Despite their increase in separating efficiency they are easy to install and maintain. Without moving parts or filters, they never require cleaning or maintaining. Get the facts on how Hi-eF Purifiers make steam cheaper. Mail coupon today!



These two bottles of condensed steam demonstrate the effectiveness of Hi-eF Purifiers in cleaning up steam. This unretouched photograph shows samples taken of condensed steam before and after passing through the purifier. Note the absence of all entrained particles, oil and gack.

WATCHDOGS OF STEAM • AIR • GAS • VAPOR PIPELINES AND EQUIPMENT



UPFLOW INTERNAL PURIFIER



LARGE LINE TYPE PURIFIER



DOWNFLOW INTERNAL PURIFIER



RECEIVER TYPE PURIFIER

THE V. D. ANDERSON COMPANY

1959 West 96th Street • Cleveland 2, Ohio
Please send bulletins covering the use of Hi-eF Purifiers in steam applications

Name _____ Title _____
Address _____
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BY THE MAKERS OF SUPER-SILVERTOP STEAM TRAPS

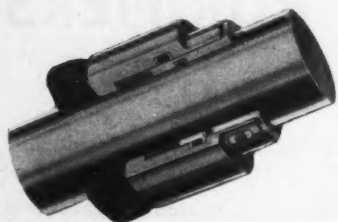
When inquiring check CP 5426 on handy form, pgs. 2-3

Simplicity of design marks O-ring seals

Uses: O-ring seals are designed to provide leakless operation of rotary shafts on centrifugal pumps handling chemicals, petroleum products, edible liquids, pulp liquors, and many other liquids.

Features: Simplicity of design is an important feature of these O-ring mechanical seals for rotating pump shafts. Small number of parts affords easy manufacturing adaptability of this seal to withstand any liquid, whether mild, harmfully corrosive, or extremely hazardous, on rotating pump shafts.

Description: Seals are furnished in Type O, an unbalanced seal for pressures up to 200 psi, and in Type OB, a balanced seal for pres-



Small number of parts affords adaptability on pump shafts

sures up to and over 1000 psi. Both types can be supplied with single spring or multiple spring, and either in pin-drive or sleeve-drive construction.

Type O seals are furnished for packing spaces 5/16" and larger. In some cases, Type O seals can be made for 1/4" packing space. Type OB seals are furnished for packing spaces 3/8" and larger. Seals are available in Teflon, Buna-N, Neoprene, or Silicone. Metal parts contacting liquid can be furnished in any suitable metal.

(Product of The Garlock Packing Co., Dept. CP, Palmyra, N. Y. . . . or for more information check CP, 5427 on handy form, pages 2 & 3.)

Sun's glare and rays reduced by use of plastic products

Uses: Anti-sun protective products, a spray-on plastic film and a sheet plastic, are for use on or in

HOW TO FIGURE THE COST OF STEAM TRAPS

STEAM TRAPS are something like wives. First, there is the cost of securing one and installing it in its new home. Then, there is the cost of maintaining it. Now, everyone knows that some wives are frugal and help their husbands a great deal, while others are frivolous spend-thrifts. It is the same way with steam traps. You have to figure the original installed cost, the maintenance cost and the effect on general operation.

Divide the total expenses by life of the trap and you get down to the real heart of the matter—the *cost per year*. This is where Armstrong steam traps really shine! Let's take a look at the details:

DIRECT TRAP COSTS

1. First Cost. The price of Armstrong traps is low in terms of capacity. An optimum relationship between leverage, bucket weight, bucket travel and orifice size gives big capacity in a small package. Armstrong steam trap capacity ratings are based on actual tests with condensate at steam temperature and with actual hookups. They tell you what the trap will deliver *on the job*. This is not generally the case with other trap ratings.

2. Installation Cost. In four of the most widely used sizes, Armstrong traps are available in either side inlet—side outlet or bottom inlet—top outlet body styles, making possible the simplest, lowest cost installation.

3. Maintenance Cost. 40% less maintenance with Armstrong traps is the average of all the maintenance reduction reports secured from users over a period of years. This is due to high quality of parts, generous safety factors and inverted bucket know-how.

4. Repair Parts Cost. Armstrong heat treated chrome steel valve parts, precision ground and lapped, last a long time. When they do require renewal, a complete new valve mechanism right off the factory production line transforms an old trap into a new one at low cost.

INDIRECT COSTS

1. Cost of Steam Waste. This cost occurs through leaky trap valves, through traps that stick open or lose prime, through extra hours of operating heat transfer equipment due to poor drainage. This is a cost you can eliminate with Armstrongs.

2. Cost of Efficiency Losses. Poor trapping cuts heat transfer efficiency. Figure how much 10% loss affects the return on a \$5000 production unit, or a \$1,000,000 plant. Armstrong traps discharge condensate and air as fast as it accumulates, keep steam equipment at peak productive efficiency.

3. Cost of Downtime. Armstrong traps stay on the job long and faithfully, eliminating the production losses caused by excessive downtime for maintenance.

A steam trap casts a mighty big shadow that is multiplied by the number of traps in a plant until it has a major effect on operating costs. When you figure the costs from all angles you will find it pays to specify "traps shall be Armstrong."

FREE: STEAM TRAP BOOK

—44 pages of prices, design, selection, installation and maintenance data on Armstrong steam traps. You are welcome to a copy. Call your local Armstrong Representative, or write.

**ARMSTRONG MACHINE WORKS**

880 Maple Street • Three Rivers, Michigan



ARMSTRONG

place of windows, respectively, in industries where glare, solar heat, and ultra-violet ray transference are problems.

Features: Products are said to filter out blinding ultra-violet rays up to 95%, reduce transmission of hot infra-red rays up to 80%, and eliminate sun-glare problems. They are weather-resistant and can be used effectively in cold climates.

Description: Both products are translucent, coming in two scientifically-balanced colors, blue-green and frost white. They provide a diffused working light. Further "shading" of factories is said to be unnecessary when they are used. Film is designed to be sprayed on windows, while shatter-proof sheet plastic is designed to be used instead of glass window panes.

(Products of Eastern Industrial Service, Inc., Dept. CP, 17 Day St., Cambridge, Mass. . . . or for more information check CP 5428 on convenient Reader Service slip between pages two and three.)

Heavy soils on iron and steel removed in one operation

Uses: For heavy-duty cleaning of iron and steel.

Features: Since material features quick wetting and penetration, plus good rinsing action, only one operation is necessary for thorough cleaning, according to manufacturer.

Description: Composition No. 26 is a free-flowing, granular material. It contains surface active agents combined with alkaline and solvent components. It is used mixed with water to make up cleaning solutions. It is readily soluble in hot water and rinses freely.

(Cleaner is a product of Oakite Products, Inc., Dept. CP, 118F Rector St., New York 6, N. Y. . . . or for more information check CP 5429 on convenient Reader Service slip between pages two and three.)

For more information on product at left, specify CP 5430 . . . see information request blank between pages 2 - 3.

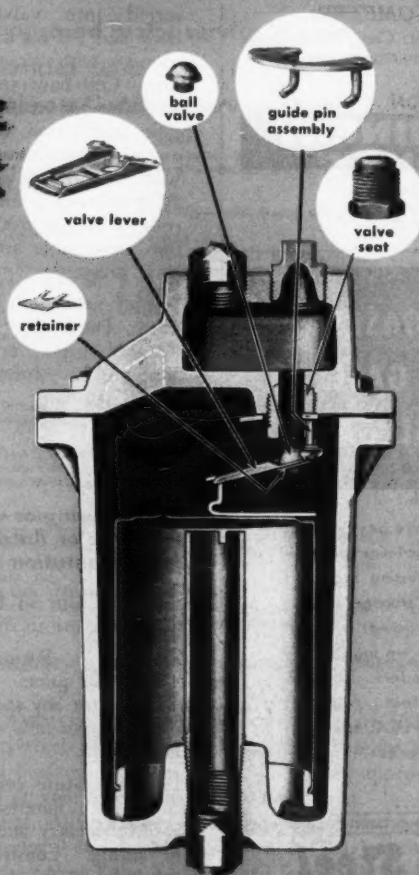


YOU CANNOT BUY A BETTER TRAP THAN AN ARMSTRONG . . .

Here Are Some Questions for Cost Comparison

1. Will the valve stay steam-tight for 2 to 3, or even up to 10 years depending on the service?
2. Will the trap discharge condensate at steam temperature to keep equipment hot and minimize non-productive radiation losses?
3. Will the trap automatically discharge air in sufficient volume to keep equipment at peak temperature and to prevent corrosion?
4. Is there enough safety margin of power in the bucket and lever to open the trap when the orifice enlarges slightly due to wear?
5. Can the trap stick in open position?
6. Is the trap apt to lose prime?
7. Are the published trap capacity ratings accurate and reliable for trap selection purposes?
8. Will the trap cleanse itself of ordinary dirt and scale?
9. Is the trap easy to install, inspect and repair?
10. Is the trap unconditionally guaranteed to give complete satisfaction?

If the trap is an Armstrong, the answer to each of these questions is favorable!



STEAM TRAPS

COST LESS!

Control YOUR CONVEYOR PRODUCTION with *Transportometer*[®] CONTINUOUS WEIGHING!

No more estimating tonnage figures or rehandling material for weighing. Installed on your present belt conveyor system, TRANSPORTOMETER can automatically and accurately weigh, regulate, totalize and record the flow of raw, intermediate or finished products. Whether it is storing, handling or processing, you get a more complete and precise control of your operations with resultant savings in material, time and labor.

Here's why TRANSPORTOMETER is the finest unit of its type made:

Completely mechanical gear differential integrator, automatically and continuously records on direct reading tonnage totalizer; automatic—no supervision after calibration; accurate—99½% or better, regardless of belt speed or tonnage; easily installed—unit supplied ready for mounting on new or existing belt conveyor; negligible wear and lowest maintenance cost of any comparable equipment.

Some of the Materials Weighed by the TRANSPORTOMETER:

Limestone; Coal; Coke; Metallic Ores; Sand; Stone; Cement; Clay; Paper Pulp; Super Phosphate; Chemicals; Coffee Beans; Pharmaceuticals;



TRANSPORTOMETER DIVISION
**SINTERING MACHINERY
CORPORATION**

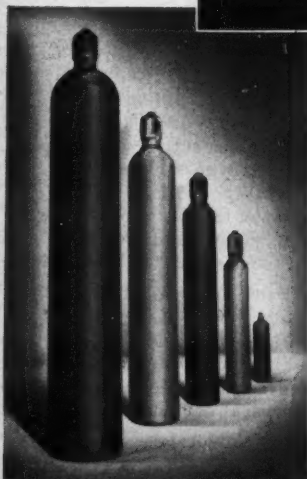
150 Sinter Avenue, Netcong, N.J.

When inquiring check CP 5431 on handy form, pgs. 2-3

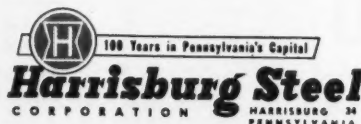


**DOES YOUR
PLANT USE
CYLINDERS
FOR...**

**FIXED GASES?
LIQUID GASES?
MEDICAL GASES?**



Harrisburg Steel's high pressure gas cylinders have been purchased by discriminating companies throughout the processing industries for many years. Wherever storage and or transportation of gases and liquids is a part of the manufacturing picture, we suggest you investigate Harrisburg Cylinders... capacities from 14 to 400 cubic feet... domestic and export types... built to I.C.C. specifications. Write for catalog and prices.



**HARRISBURG CYLINDERS
FOR HIGH-PRESSURE GASES**

When inquiring check CP 5432 on handy form, pgs. 2-3

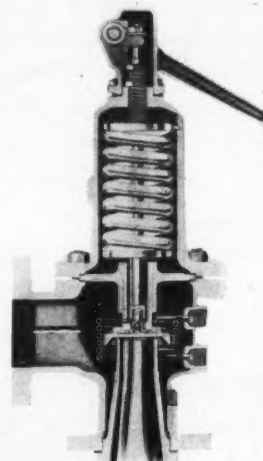
CONSTRUCTION & MAINTENANCE

Internal heat exchanger featured on safety relief valve

Manufacturer's nozzle and semi-nozzle safety relief valves feature an internal heat exchanger. This unit can be incorporated in valve body without creating interference with the rest of valve mechanism.

Internal heat exchanger eliminates necessity of steam tracing or steam jacketing a valve where highly viscous lading is encountered. Exchanger is said to keep lading material in a fluid state with very low steam consumption. It provides maximum efficiency by placing steam where it is most effective.

Exchanger consists of a steel coil inserted into valve body and led out to connect with steam line. Coil ends are accessible for return-pipe installation or one-pipe installation with a vent valve. A steam trap drains coils and construction is suitable for back pressure.



Cutaway shows internal construction including heat exchanger

(Relief valves are a product of Farris Engineering Corp., Dept. CP, 505 Commercial Ave., Palisades Park, N. J. . . or for more information check CP 5433 on handy form, pages 2 and 3.)

No soldering or welding of joints with line of flareless tube instrumentation fittings

Uses: Line of flareless tube fittings is especially suited for use in instrumentation.

Features: Fittings do not require soldering or welding of joints. There is no flaring of tube and no need for any special tools. All that is needed to complete assembly of a joint is a wrench to tighten fitting nut.

Fittings feature company's "In-Tru" ferrule to accommodate flareless tube. Design permits rapid, easy tube entry and connection without disassembly of fitting. Construction consists of three parts: connector or fitting body, nut, and ferrule or sleeve.

Description: After tube is seated, nut is tightened. Tightening of nut exerts a wedging force on ferrule. Ferrule, in turn, bites into outer surface of tubing, forming a "shoulder." This shoulder insures a leak-exposed, extent of bite into tube is readily visible proof connection. Because cutting edge of ferrule is if joint is disconnected for inspection. After in-

**WORLD'S FINEST
PACKING & GASKET
MATERIAL**

TEFLON

**IS PROCESSED BEST
BY CHEMICAL & POWER
PRODUCTS**

BECAUSE:

**Whether your need is for V.
type packing expansion
joints, machined or molded
parts or for Teflon in sheets,
rods and tubes you can't
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Products record of:**

EXPERIENCE: First manufacturer of satisfactory resilient Teflon packing in the U. S.

REPUTATION FOR QUALITY: Customers return time after time because they know that regardless of the size of the order or the processing problem, only the best in finished materials is allowed to be shipped.

Convince yourself that Chemical & Power is the right source for you. Send for Catalog and price list today.



When inquiring check CP 5434 on handy form, pgs. 2-3

CHEMICAL PROCESSING

spection, fitting is reassembled by hand until ferrule is seated. An additional 1/6 to 1/3 turn of nut completes assembly. Entire assembly is said to take only a matter of seconds.

Complete fitting line includes: male and female connectors, unions, male and female elbows, male and female run and outlet tees, union tees and crosses, nuts, ferrules, and tube end reducers. Tube OD from 1/4 to 1" are accommodated, and brass fittings for use with copper tubing are available. Fittings in aluminum alloy for use with aluminum tubing are available on special order.

(Product of The Parker Appliance Co., Dept. CP, 17325 Euclid Ave., Cleveland 12, Ohio . . . or for more information check CP 5435 on handy form, pages 2 and 3.)

Horsepower ratings increased on totally-enclosed turbine pump motors

Horsepower ratings of totally-enclosed and explosion-proof vertical turbine pump motors have been increased to 75 hp by manufacturer. Available with either hollow shaft or solid shaft construction, these motors are designed for powering turbine pumps in such installations as refineries, sewage disposal plants, and the like.

Explosion-proof vertical motors are designed to comply with UL specifications for Class I-Group D, highly flammable gases and volatile liquids, and Class II-Groups F and G, for combustible dusts.

Totally-enclosed vertical motors are suited for service in plants or locations where non-explosive conditions prevail, for protection against non-combustible dust, dirt, moisture, abrasives, and corrosive-forming dripping. Both type motors are double-enclosed for fullest protection with a built-in fan for rapid heat dissipation.

(Product of U. S. Electrical Motors, Inc., Dept. CP, Box 2058, Terminal Annex, Los Angeles 54, Calif. . . . or for more information check CP 5436 on handy form, pages 2 and 3.)



Rating increased to 75 hp

Savings result from use of abrasive belt splicer

Description of operation as well as savings resulting from use of abrasive belt splicer are contained in Bul 310 issued by Aget-Detroit Co., Dept. CP, Ann Arbor, Mich. When inquiring specify CP 5437 on handy form, pages 2 and 3.

Motor Repair Service Wherever You Are

"Certified"

Factory approved motor service in every
industrial area from 101
Allis-Chalmers Certified Service Shops.

ALABAMA
Birmingham—Elec. Repair & Serv. Co.
Greenville—Mowbray Eng. Co.
Montgomery—Standard Electric Co.

ARIZONA
Bisbee—Copper Electric Co. Inc.
Phoenix—Daley Electric Company

CALIFORNIA
San Diego—Calif. Elec. Works
Los Angeles—Larsen-Hogue Elec. Co.
Oakland—Pacific Elec. Motor Co.
T. L. Rosenberg Co.
San Francisco—Weidenthal-Gosliner Electric Works

COLORADO
Denver—Baker Electric Company

CONNECTICUT
Hartford—Charles H. Leppert
Waterbury—Elec. Motor Repair Co., Inc.

FLORIDA
Jacksonville—Turner Electric Works
Miami—Peninsular Armature Works
Tampa—Tampa Armature Works, Inc.

GEORGIA
Albany—Georgia Electric Co.
Atlanta—Bearden-Thompson Elec. Co.
Columbus—Smith-Gray Electric Co.

ILLINOIS
Chicago—Chicago Electric Co.
Marion—Giles Arm. & Elec. Wks., Inc.
Mt. Vernon—Dowzer Electric Machinery Works, Inc.

INDIANA
Indianapolis—Scherer Electric Co., Inc.
Evansville—Evansville Elec. & Mfg. Co.

IOWA
Sioux City—Smith Elec. & Supply Co.

KANSAS
Salina—Cent. Kans. Elec. Mach. Co.
Wichita—Tarrant Electric Mach. Co.

LOUISIANA
New Orleans—Industrial Elec., Inc.
Shreveport—Shreveport Armature & Electric Works

MAINE
Brewer—Stanley J. Leen Co.

MARYLAND
Baltimore—Keystone Electric Co., Inc.

MASSACHUSETTS
Lawrence—Roland B. Glines Co.
Springfield—Elec. Motor Repair Co.

MICHIGAN
Detroit—Stecker Electric Company
Grand Rapids—Grand Rapids Industrial Electric Co.
Saginaw—Banning Elect. Prod. Corp.

MINNESOTA
Duluth—Mielke Electric Works, Inc.
Minneapolis—Parsons Elec. Co.

MISSISSIPPI
Vicksburg—Ludke Electric Co., Inc.

MISSOURI
Kansas City—Boese-Hilburn Elec. Co.
St. Louis—French-Garleman Elec. Co.
Springfield—Springfield Elec. Serv. Co.

NEBRASKA
Omaha—Omaha Electrical Works

NEW HAMPSHIRE
Concord—A. S. Tracy

NEW JERSEY
Atlantic City—Charles A. Buckley
Paterson—Elec. Service Repair Co.
Trenton—Lockwood Elec. Motor Serv.

NEW MEXICO
Albuquerque—Electric Motor Company
Powell Electric Co.

NEW YORK
Buffalo—Robertson Electric Co.
Vollard Elec. Equip. Co., Inc.
Flushing—Flushing Elec. Corp.
Jamestown—A. E. Westburgh
Mt. Vernon—H. A. Schreck, Inc.
New York—Consol. Elec. Motor Co.
Rochester—Vanderlinde Elec. Corp.
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CONTROL — Manual, magnetic and combination starters; push button stations and components for complete control systems.

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When inquiring check CP 5438 on handy form, pgs. 2-3

OXYGEN WHEREVER NEEDED



**AIR FORCE
ENGINEER CORPS
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all have important needs
for oxygen, met in combat
areas by these mobile oxy-
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has developed important components for these, as well as industrial systems involving the production and use of special gases, controlled atmospheres, control of moisture and heat in air and gases, heat transfer between gases and liquids, condensation of vapors and gases, heating, cooling, refrigeration, moistening, drying and treating air and gases for exact control of moisture.

If your process, material or product needs protection or improvement by a better control of atmospheric conditions, or if you require such controlled conditions for testing or production, your nearest Niagara Engineer has experience that can help you. Write to the Niagara Blower Company, Dept. CP, 405 Lexington Ave., New York 17, N. Y.

INDUSTRIAL COOLING • HEATING • DRYING
NIAGARA
HUMIDIFYING • AIR ENGINEERING EQUIPMENT

When inquiring check CP 5439 on handy form, pgs. 2-3

CONSTRUCTION

**Volatile liquids handled
by refinery-type
pump . . .**

casings permit wide capacity range with little wear

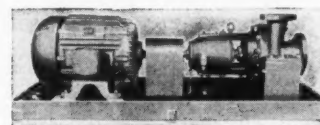
Uses: Designed to handle extreme ranges of temperatures, pressures, and volatility.

Features: Net positive suction head requirements of pump are said to be very low to facilitate handling of volatile liquids.

Double volute casings in larger sizes, 4 x 3" and 6 x 4", permit operation over the wide range of heads and capacities often required in process work without excessive wear or damage to pump.

Description: This single-suction, single-stage type pump is available in seven sizes at capacities to 1300 gpm, for pressures up to 600-ft head, and up to 800° F.

Unit has a water-cooled stuffing box and water-cooled bearings. A water-flushed smothering gland removes any danger of flammable



Single-suction single-stage type pump is offered in seven sizes

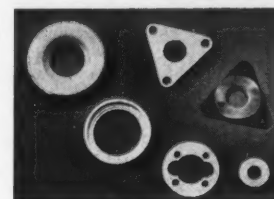
material escaping and also cools shaft and sleeve. It can be connected to water jacket of stuffing box by a flexible hose, needle valve, and pipe fittings.

Where packing is to be used, pump is designed to take eight rings of packing and a seal cage. This cage has in-and-out connections for sealing oil. Stuffing box is provided with renewable throat bushing; all stuffing box pieces are faced & bored for mechanical seals.

Pumps are furnished with all-metal spacer-type couplings. This permits disconnecting pump from driver and removing entire rotating assembly without disturbing either piping or driver. In addition, two sets of bearing bracket assemblies fit complete range of 7 pump sizes.

(Product of Allis-Chalmers Mfg. Co., Dept. CP, 1151 S. 70th St., Milwaukee 1, Wis. . . . or for more information check CP 5440 on handy form located between pages two and three.)

LOOK AT THESE PROPERTIES OF DU PONT TEFLON*



For gaskets, packings and other process equipment, Du Pont "Teflon" offers this unique combination of properties:

- **CHEMICAL INERTNESS** — completely unaffected by acids, alkalis, aliphatics, aromatics, chlorinated hydrocarbons . . . all chemicals except molten alkali metals and fluorine.
- **HEAT RESISTANCE** — continuous service up to 500°F.
- **LOW TEMPERATURE TOUGHNESS** — as low as -320°F.
- **NON-ADHESIVENESS** — the tackiest materials show little tendency to stick to "Teflon."
- **LOW COEFFICIENT OF FRICTION** — either against itself or other materials.
- **ZERO MOISTURE ABSORPTION**
- **WEATHER RESISTANCE**

The Du Pont Polychemicals Department supplies "Teflon" in the forms of molding powders and aqueous dispersions. We'll gladly suggest names of processors of sheets, rods, tubes and finished parts. For full information, write: E. I. du Pont de Nemours & Co. (Inc.), Polychemicals Department, Room 1612 Du Pont Bldg., Wilmington 98, Del.



*Trademark for Du Pont tetrafluoroethylene resin

BETTER THINGS FOR BETTER LIVING
... THROUGH CHEMISTRY

When inquiring check CP 5441 on handy form, pgs. 2-3

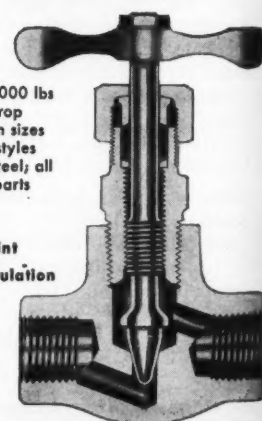
Protect Meters, Instruments

Edward Gage Valves

Moderately priced, these low cost compact valves find many applications for gage, meter and instrument service. Rated conservatively for 4000 lbs at 150F, 600 lbs at 750F, these drop forged steel valves are furnished in sizes from 1/8" to 1". Globe and Angle styles in three body materials—carbon steel; all parts 13% chromium steel; or all parts 18-8 stainless steel. Construction features include:

- tight tapered body-bonnet joint
- semi-needle stem for fine regulation
- wide seat joint for tight seating
- bonnet and packing nut plated to reduce galling and corrosion

For complete information write for Catalog 104.



Another Product

Edward Valves, Inc.

Subsidiary of ROCKWELL MANUFACTURING COMPANY
1230 West 144th Street, EAST CHICAGO, INDIANA

When inquiring check CP 5442 on handy form, pgs. 2-3

CHEMICAL PROCESSING

Cost of maintenance reduced by gas-shielded welder

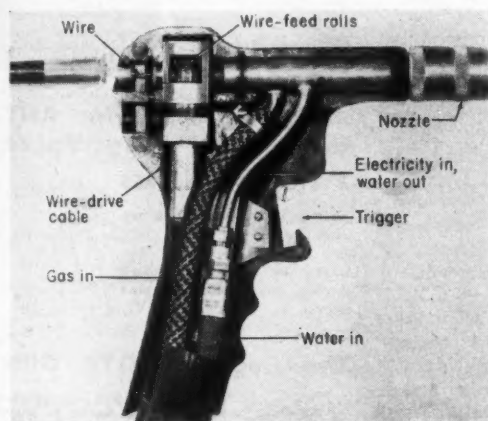
Uses: Consumable-electrode unit is for high-speed, high current-density, gas-shielded welding applications.

Features: High-speed metal deposition provided by apparatus enables operator to more than double output on applications where filler metal must be added. In addition, equipment is said to simplify control, decrease operator training time, and reduce operating and maintenance costs.

Description: Fillerarc equipment consists of three main components: a self-regulating motor-generator type welder, a pistol-like holder, and an electronic wire-drive unit.

Welding generator is rated at 450 amp continuously and has a rising volt-amp characteristic. Designed to give constant arc length, welder produces any current required up to its full rating. Thus, it is prepared for any wire feeding speed and will supply current necessary to melt off wire at exactly the rate it is fed.

Gun contains knurled feed rolls for pulling electrode wire from a spool mounted in wire drive unit, a trigger to control wire feed and gas flow, and an electrical contact tip. It is water-cooled with a rating of 400 amp continuous DC. Gun is capable of feeding

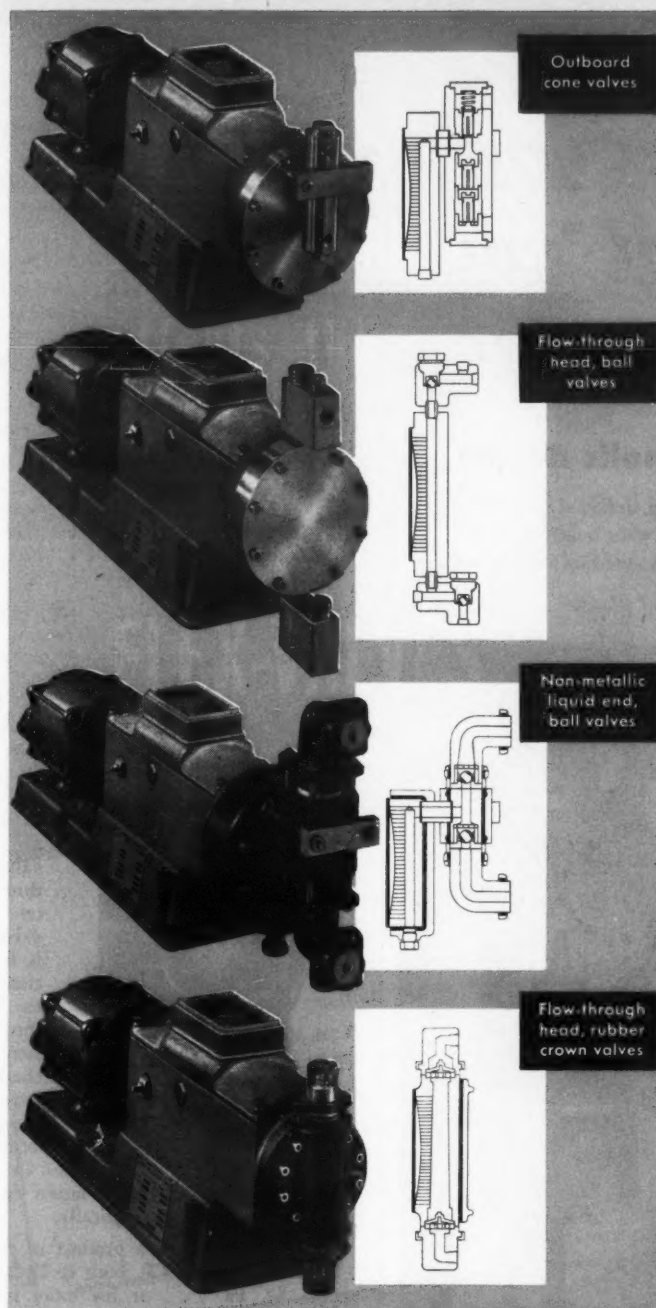


Cutaway view shows main components of welding gun

wire from .030 to .093" in diam of aluminum, steel alloys and other metals, with no special temper required. Wire-feed speed can be adjusted from 0 to 750" per min by means of a remote two-speed switch, and set speed can be held constant.

Fillerarc wire drive unit is mounted on a portable carriage. It contains a wire feed drive motor control which powers the knurled feed rolls in welding gun through a flexible shaft. It incorporates a voltmeter for indicating wire feed speed in inches per minute as well as arc voltage, a gas solenoid valve, control relays, and a spindle for electrode wire. Unit operates on 220 v, single phase, 60 cycle power.

(Fillerarc welder is a product of Welding Dept., General Electric Co., Dept. CP, One River Rd., Schenectady 5, N. Y. . . or for more information check CP 5443 on handy form, pages 2 and 3.)



POSITIVE DISPLACEMENT...AND NO STUFFING BOX!

Lapp Pulsafeeder is the combination piston-diaphragm pump for controlled-volume pumping of fluids. Reciprocating piston action provides positive displacement. But the piston pumps only an hydraulic medium, working against a diaphragm. A floating, balanced partition, the diaphragm isolates chemical being pumped from working pump parts—eliminates need for stuffing box or running seal. Pumping speed is constant; variable flow results from variation in piston-stroke length—controlled by hand-wheel, or, in Auto-Pneumatic models, by instrument air pressure responding to any instrument-measurable processing variable.

4 VALVE CONSTRUCTIONS

TO CHOOSE FROM IN

Lapp PULSAFEEDER

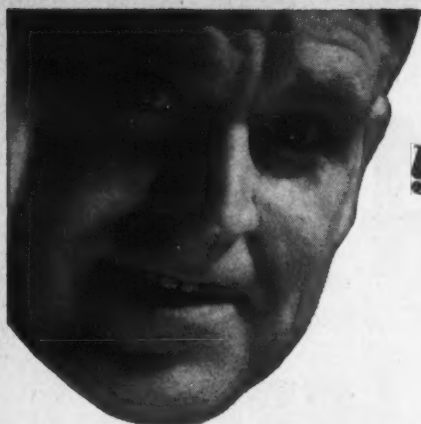
PISTON-DIAPHRAGM CONTROLLED-VOLUME CHEMICAL PUMPS

No one valve design or construction is adequate to handle all types of materials which must be pumped in controlled volume. Experience indicates that flow characteristics of fluids are greatly influenced by viscosity, specific gravity, lubricity and temperature; solids in suspension require a special design, whereas low-viscosity, non-lubricating liquids present a wholly different valving problem. Lapp offers the Pulsafeeder in a variety of liquid-end designs, materials of construction, and valve assemblies—four of which are shown here. For your "special problem" in proportioned pumping of liquids, ask us for an engineering recommendation on the Pulsafeeder assembly specifically suited.

WRITE FOR BULLETIN 300 with typical applications, flow charts, description and specifications of models of various capacities and constructions. Inquiry Data Sheet included from which we can make specific engineering recommendation for your processing requirement. Write Lapp Insulator Co., Inc., Process Equipment Div., 103 Wilson St., Le Roy, N. Y.

Lapp

When inquiring check CP 5444 on handy form, pgs. 2-3



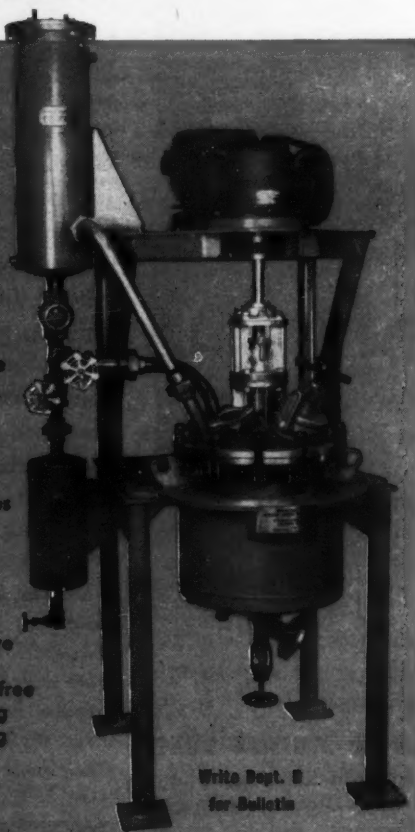
**you can
get 'em
now**

Lab Pilot Kettles for Phenolic Resins

This is new. It's the first lab pilot kettle of its kind, designed specifically for phenolic type resins. Versatility was maintained while building specific job requirements into the Model C-10 kettle. It can be used for many other applications besides phenolic type resins.

Here are the clear-cut features of this new Brighton development:

- Anchor type agitator with variable-speed drive
- Condensing arrangement for either refluxing or withdrawing
- Vacuum operation of kettle
- Steam jacketed for 90 psi
- Jacket provided with continuous spiral baffle to insure maximum cooling efficiency when water is circulated
- Condenser and receiver
- Made according to ASME code, inspected and stamped for internal pressures up to 25 psi or vacuum
- Production sizes can be built up to 3000 gallon capacity
- Overall dimensions—86" x 39" x 56"
- Flush-type bottom outlet valve
- Stainless steel construction
- Specially designed, trouble free oilless agitator shaft bearing
- Sight glasses, quick opening handhole
- Priced to fit your budget—minimum capital investment



Write Dept. B
for Bulletin



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DIVISIONS: F. C. DECKBACH SONS CO., HAMILTON COPPER & BRASS WORKS, BUCYRUS KETTLE WORKS
est. 1914 • engineers • metalsmiths • machinists • designers, producers of chemical processing equipment

When inquiring check CP 5445 on handy form, pgs. 2-3

CONSTRUCTION & MAINTENANCE

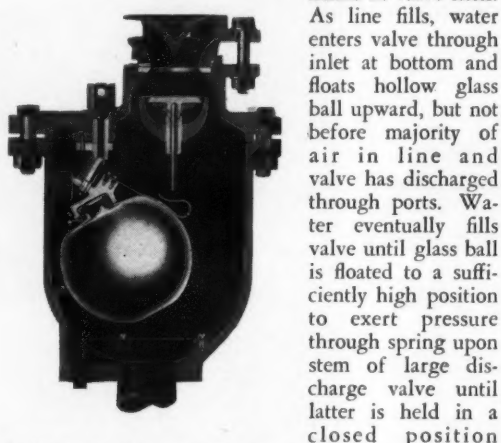
Function of two valves performed by one unit in air release, vacuum breaking applications

Uses: For use wherever air accumulations must be released or lines voided of air, or where it is necessary to admit quantities of air to a piping system quickly to avoid formation of vacuums.

Features: Valve was designed for the purpose of having three separate and distinct functions: releasing automatically air accumulations from pipe systems, admitting air to systems to break vacuums, and venting air from systems when filling pipe lines with water. Design permits valve to combine three functions ordinarily accomplished by two separate units.

Description: Type AV valve is designed with a 2" threaded inlet opening. Valves are furnished as standard units with working pressures up to 150 psi. Compact design has maximum diameter of 11½" and overall height of 16¼". Net weight of each unit is 160 lb.

Illustration shows valve in an open position as it is installed on a 2" riser attached to pipe line where line has been drained of water so that no liquid remains in valve shell.



As line fills, water enters valve through inlet at bottom and floats hollow glass ball upward, but not before majority of air in line and valve has discharged through ports. Water eventually fills valve until glass ball is floated to a sufficiently high position to exert pressure through spring upon stem of large discharge valve until latter is held in a closed position

against its seat. Small valve continues to discharge air until float rises a fraction of an inch further and seats valve. Drainage of liquid from valve allows air to enter line automatically.

(Type AV valve is a product of Simplex Valve & Meter Co., Dept. CP, 68th & Upland St., Philadelphia 42, Pa. . . . or for more information check CP 5446 on handy form, pages 2 and 3.)

High resistance to acids, alkalis provided by braided asbestos rod packing . . .

material has impregnation of 35% Teflon

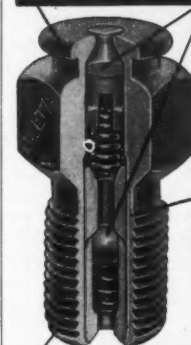
Uses: Two types of packing are supplied: white asbestos impregnated with tetrafluoroethylene resin is designed for dilute acids, caustics, and various chemicals on centrifugal or reciprocating pumps and

**See WHY
DELTA Grease Fittings
for Lubricated Plug Valves
.... DON'T LEAK
.... LAST LONGER
.... WORK BETTER
.... ARE SAFER !**

HEAD FITS ALL
STANDARD HIGH PRESSURE
GREASE GUN COUPLERS

DOUBLE
CHECK VALVES

Steel ball-type check valve in body. Piston-type check valve in head makes metal-to-metal seal—no gaskets to leak or wear out and cause valve button to protrude and become damaged or lock coupler on fitting.



ONE-PIECE
STEEL BODY

No threads to leak or loosen. No danger of tampering or removing check valves.

15,000 lb. TEST

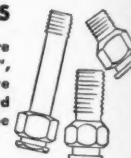
Type H and type P fittings are guaranteed not to leak under 15,000 lb. pressure.

CADMIUM PLATED
PROTECTIVE FINISH

A DELTA Fitting for ANY Lubricated Plug Valve

3 TYPES — 5 SIZES

All Delta Grease Fittings are available in ¼", ¾", 1½", 2" and 3", with all five sizes in three standard threads, fine, coarse, and pipe thread.



The Rugged DELTA GUN



Develops 10,000 lb. pressure. Heavy barrel tested to 30,000 lbs. Fast, positive prime, handles heaviest lubricants.

Get this CATALOG

Complete information on Delta Fittings, Gun, Automatic Lubricator, and DELTA-DESCO Lubricants for any valve service.



DELTA

ENGINEERING SALES CO.

The Only Complete Plug Valve Lubrication Company

802 Louisiana Ave. — Phone 5-2416

SHREVEPORT, LOUISIANA, U.S.A.

Sales Offices in ALL Principal Cities

When inquiring check CP 5447 on handy form, pgs. 2-3

CHEMICAL PROCESSING

valve stems; blue asbestos is recommended for use on similar installations where acids and chemicals of higher concentrations are handled.

Features: Rod packings of braided asbestos, impregnated with 35% Teflon, offer high resistance to chemicals, including virtually all petroleum and coal tar solvents.

Description: Impregnated packings are expected to provide longer service life than packings previously available because of higher chemical resistance. They perform from -90 to +500°F.

(Packings are a product of the U.S. Rubber Co., Dept. CP, Rockefeller Center, New York 20, N. Y. . . or for more information check CP 5448 on handy form, pages 2 and 3.)

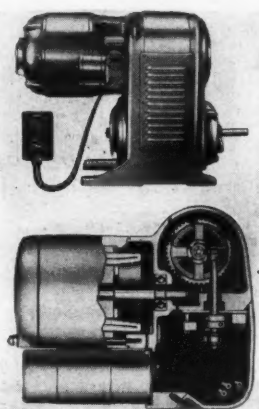
Variable speed drive operated by remote control unit

Uses: To provide positive, electrically driven remote control for company's variable speed motors.

Features: Unit, called ERC remote control motor, replaces control handle and enables operation of variable speed drive from a control station at a distance. Remote control motor is operated by push-button.

Description: Auxiliary motor is ruggedly designed and is 1/15 hp, 1800 rpm, of the reversible capacitor type. It has a low inertia rotor for quick stop. Worm drive of ERC actuates motor's speed control shaft as well as adjustable limit switches. Connection box is an integral part of the unit.

(Product of U.S. Electric Motors, Inc., Dept. CP, Box 2058, Los Angeles 54, Calif. . . or for more information check CP 5449 on handy form, pages 2 and 3.)



Compactly attached to variable speed drive, remote control motor replaces control handle

Pictures industrial flooring

Eight-page, illustrated booklet explains advantages of Plastic Pellets in an asphalt-rock mixture for industrial flooring.

Booklet, "Plastic Pellets", is available from Flash-Stone Co., Inc., Dept. CP, 3723 Pulaski Ave., Philadelphia 40, Pa. When inquiring specify CP 5450 on handy form, pages 2 and 3.

NOT EVEN HOT SULPHURIC ACID affects the efficiency of these FLEX-VALVES

A solution of copper sulphate with a high concentration of sulphuric acid—at approximately 180° F—has failed to give these valves trouble in more than two years. At a leading smelting and refining company*, where precious metals are refined and copper sulphate is produced, FLEX-VALVES have once again proven the superiority of their simple construction and corrosion resistant characteristics. If you have a fluid that's "too hot to handle" for ordinary valves, specify trouble-free FLEX-VALVE. Write for catalog No. FL 382.

*name available on request.

Exclusive FLEX-VALVE Features
(Pat'd and Pat. Pending)

- Will outwear any metal valve on abrasive service. Proven minimum 11 to 1 life over metal
- Excellent control characteristics in first 1/3 of travel
- Tight on grits up to 1/8"
- Valve body available in pure gum rubber, neoprene, butyl, buna-n, buna-s, food stock and special compounds
- Full pipe capacity
- Will not freeze up in outdoor service
- Complete closure for bubble-air tightness
- No obstruction, pockets or internal parts.

**Your Money Back
if it Plugs.**

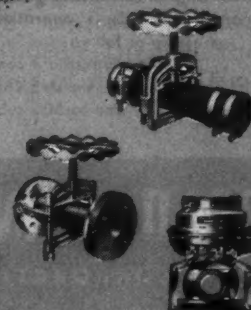
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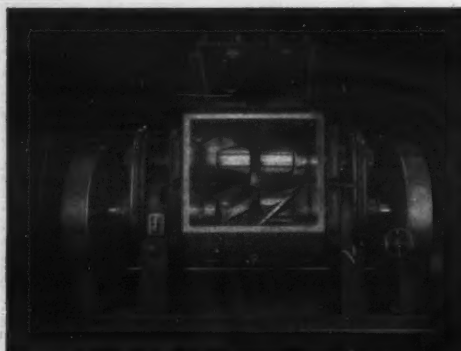
affiliates: FARRIS ENGINEERING CORP. • FARRIS STACON CORP. • FARRIS HYDROSEAL CORP. • FARRIS HYDROTORQUE CORP. • FARRIS PICKERING GOVERNOR CO.



When inquiring check CP 5451 on handy form, pgs. 2-3



*Trademark of dependability
in mixing and blending*

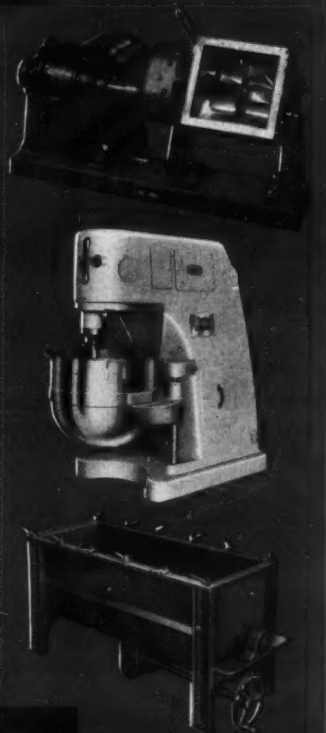


HEAVY DUTY DOUBLE-ARM MIXERS in tilting and stationary bowl models... for atmospheric, reduced, or elevated pressures... with single, multiple, or variable-speed drives and temperature controlling jackets... overlapping mixing arm action eliminates dead spots... sigma and other type mixing arms... working capacities one quart to 1500 gallons.

LABORATORY MIXERS for the most exacting types of laboratory mixing... built in working capacities of one, three, six and 20 quarts.

VERTICAL MIXERS, planetary action, for processing of dry materials, creams, emulsions, and light plastic masses... a complete line with multiple beater speeds and designed to accommodate several sizes of bowls... many auxiliary attachments available... 12 to 175 quarts.

SPIRAL RIBBON MIXERS for continuous or batch blending and mixing of pulverized, granular dry or wet materials... operation under pressure or full vacuum... with or without temperature controlling jackets... working capacities one to 500 cubic feet.



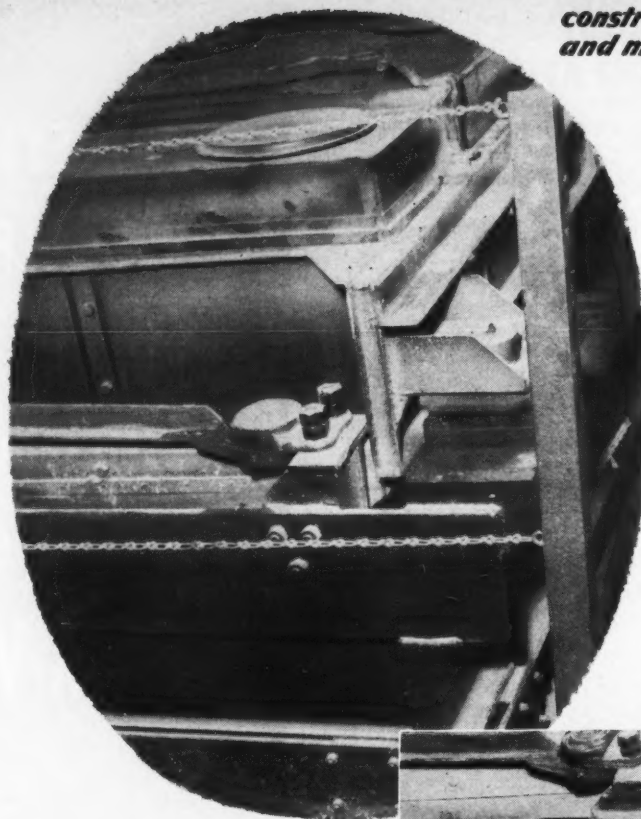
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CORPORATION

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Processing Equipment... ask for
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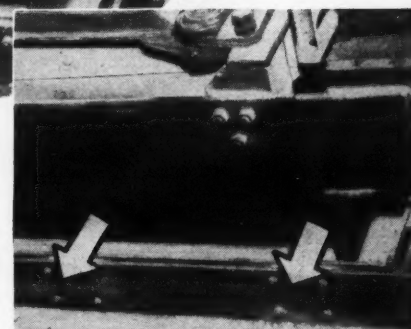
When inquiring check CP 5452 on handy form, pgs. 2-3

*construction
and maintenance*



View of one end of classifier held by vibration eliminator, which consists of rubber blocks plus the steel framework

Damage to building structure formerly occurring is now prevented by use of vibration eliminator on classifier at the Warners, N. J. plant of American Cyanamid Co. Arrows indicate position of rubber blocks



use of vibration eliminator takes shock from columns supporting classifier

**previously hollow tile wall near
unit was being shaken loose**

Problem: At the Warners, N. J. plant of American Cyanamid Co., in the manufacture of calcium cyanide products, it is necessary to use a classifier approximately 100 feet in the air supported on steel columns. This unit vibrates with an oscillating motion at 228 cycles per minute.

Although vibration is not excessive on this type of unit when it can be mounted on a firm foundation, in this application vibration was excessive. In fact, the hollow tile wall next to the classifier was being shaken loose.

Solution: About two years ago changes were made in the method of supporting the classifier so that its entire frame is

CHEMICAL PROCESSING

held by a vibration eliminator. At each corner of the unit one side of a flat rubber block is vulcanized to a framework bolted to the classifier and the other side to a steel plate supported by the columns. The entire 4100 pound weight of the unit is held by the rubber blocks which are subjected to shearing action. It hardly seems possible that rubber blocks could hold this great a vibrating weight in this manner without being torn loose.

Accompanying photographs show the classifier as mounted at present. The vibration eliminator consists of the rubber blocks plus the steel framework on either side.



One of flat rubber blocks can be easily seen in this photograph of a corner of other end of classifier

Results: The shock on the supporting columns has been reduced appreciably by the use of the vibration eliminators. Building wall is no longer subjected to the strain that formerly was shaking the hollow tile loose. Although it may be necessary in time to replace the front section of the vibration eliminator which is subjected to the heaviest load, no maintenance has been necessary during the two year period it has been used so far.

(Product of Vibration Eliminator Co., Dept. CP, 10-28 47th Ave., Long Island City 1, N. Y. . . . or for more information check CP 5453 on handy form, pages 2 and 3.)

AT THE CHEMICAL SHOW . . .

Be sure to visit the CHEMICAL PROCESSING
exhibit — booth 610

SPRAY A CADDY with *White Wash?*



TYGON Paints are blends of chemically inert plastic resins and balanced solvents which quickly air dry leaving an extremely tough, flexible, chemically resistant film — a virtually impenetrable barrier against most acids, alkalies, oils, alcohols, fresh and salt water. They can be applied cold by spray gun or brush. Colors—white, black, gray, green, red, aluminum and clear.



It makes just about as much sense as trying to protect expensive process equipment with a protective coating bought because it was pennies cheaper in the can.

It can be dollars dearer in your plant when it fails to *protect!*

Corrosion-Resistant TYGON Plastic Paint — not an ordinary paint — has a proven record of success against all forms of corrosion (corrosive fumes, condensates and spillage) since it first became available commercially in 1939.

We know that TYGON Paint is an excellent protective coating, but like everything else in this world, TYGON, too, has its limitations. Our literature tells what these are. We know also that when applied with reasonable care, under the many conditions for which it is suitable, TYGON Paint *out-performs* and *out-lasts* practically any other coating.

A suggestion — write for your free copy of Bulletin 750 which includes the performance record of TYGON Paint with over 175 *corrosives* — acids, salts, alkalies etc. Then if you think TYGON Paint may be the answer to your corrosive problems, buy a trial quantity and *test* it.

You will investigate TYGON Paint eventually, why not *today?* Address Plastics and Synthetics Division. The U. S. Stoneware Co., Akron 9, Ohio.

*plastics
and
synthetics
division*

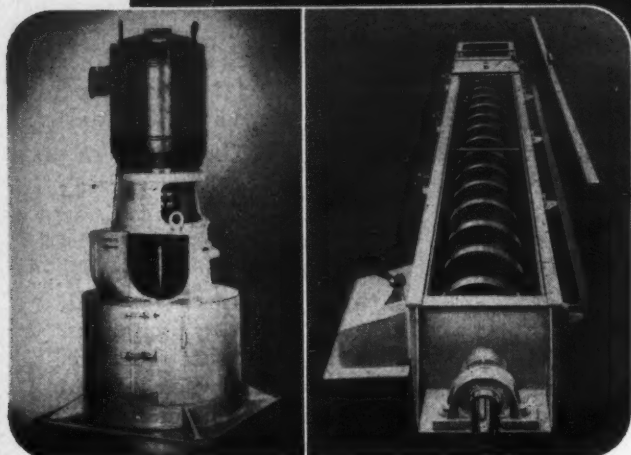

U. S. STONEWARE
AKRON 9, OHIO

When inquiring check CP 5454 on handy form, pgs. 2-3

227-D

We invite you to...

prove for yourself
how *Rietz* equipment
can improve your
PROCESSING



TEST your process in our laboratories, at our expense. If your process requires size reduction or mixing, send samples of your product, with your requirements, for testing on *Rietz Disintegrators*.

Where continuous heating, cooling, drying, or mixing are required, we test your product for you in modern *Rietz Thermascrows*.

These tests can save you money!

Hundreds of processors have profited from special tests in our laboratories, before installing their own process lines. We urge you to write today: we're anxious to have you prove for yourself that *Rietz* equipment can do an effective job in your plant!

Write to Development Division

Rietz

**MANUFACTURING
C O M P A N Y**

Santa Rosa • California

When inquiring check CP 5455 on handy form, pgs. 2-3

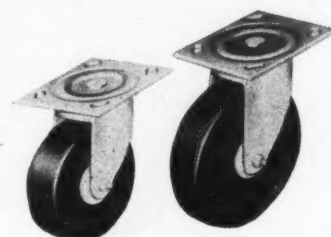
CONSTRUCTION

Swivel casters have double ball-bearing races

Uses: For easier handling of movable equipment such as trucks used in factories and warehouses.

Features: Casters have double ball-bearing swivel action and fully case-hardened raceways.

Description: These casters, both 5 and 6" in manufacturer's Series 68, are designed to handle loads up to 1400 lb. Each size is offered with soft rubber tread or solid com-



Casters have fully case-hardened raceways

position molded wheels with 1½" tread widths, and is furnished standard with roller bearings and thread guards. Specially designed rigid casters to match the swivel are available.

(Product of The Bassick Co., Dept. CP, Bridgeport 2, Conn. . . . or for more information check CP 5456 on handy form located between pages two and three.)

Attachment converts drill to mill

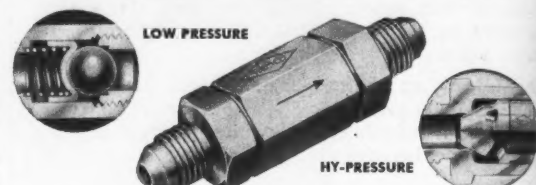
Uses: For combination angular and straight line cuts on shapers, milling machines, and grinders. Also for use on drill presses and lathes.

Features: When used on a drill press, work table attachment accurately spaces drilled holes and by chucking an end mill, drill press converts to a light milling machine. By attaching unit to face plate of a lathe, spaced holes for jigs and die blocks can be bored with micrometer accuracy, according to manufacturer.

Description: Upper and lower tables are identical, and upper table may be removed when not needed. Both upper and lower slides have

**REPUBLIC
VALVES**

INDUSTRIAL • CHEMICAL • AIRCRAFT



Check Valves are sturdily built for either 500 psi or 3,000 psi hydraulic service—brass, aluminum alloy, steel, and stainless steel. Pipe, or AN or J.I.C. tube ends, or combinations. Sizes ½" to 1".

Manufacturers also of high quality globe, needle, relief, and 2, 3, and 4-way plug valves, and special valves to specifications.

Write for complete catalog and name of nearest distributor.



RM
REPUBLIC MANUFACTURING CO.
1930 WEST 77TH STREET • CLEVELAND 2, OHIO

When inquiring check CP 5457 on handy form, pgs. 2-3

GENERAL MANAGER

Recognized, successful company with established distribution of essential soil ingredient is seeking a General Manager. Company is planning to expand its manufacturing operations in Northwest and therefore it would be appropriate if General Manager had engineering training, preferably chemical engineering, and it would be helpful if he knew mining or process manufacturing and how to establish a new enterprise. He should have General Manager capabilities, possess initiative and business sense, be able to develop team of workers, and handle all relationships well. This important permanent position has developed because of expansion and requires an able administrator. Age 38-50. Salary appropriate. Replies respected and held in confidence. Box 102, c/o Putman Publishing Company, 111 East Delaware Place, Chicago 11, Illinois.

CONSTRUCTION

a maximum travel of 4" and revolve on graduated swivels through 360°. Slides may be used without swivels to reduce height. Two feed screws are equipped with micrometer collars reading in thousandths

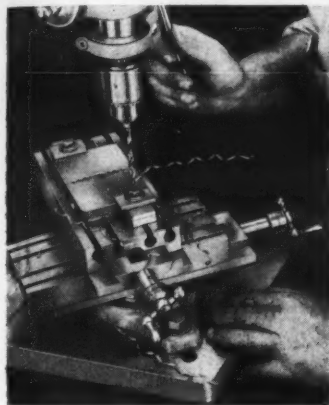


Table assures accuracy

of an inch. Measuring 4 x 8-7/8", each precision ground work table has 4 slots for clamp bolts. Full length take-up gibs on dovetails insure accuracy of table.

(Universal Table is a product of South Bend Lathe Works, Dept. CP, 425 E. Madison St., South Bend 22, Ind. . . . or for more information check CP 5458 on handy form, pages 2 and 3.)

Directory of beryllium properties, products

Twenty-page product directory covers in concise form the various commercial products offered by manufacturer. These include beryllium master alloys, beryllium copper wrought products, beryllium casting ingots and other items such as castings, non-sparking tools, forgings, beryllium oxide, beryllium metal and ferro-beryllium.

Product Directory is available from The Beryllium Corp., Dept. CP, Reading, Pa. When inquiring specify CP 5459 on handy form, pages 2 and 3.

For more information on product at right, specify CP 5460 . . . see information request blank between pages 2 - 3.

So hard it cuts glass . . .

This striking photo demonstrates the extraordinary hardness of silicon carbide. As seen through a pane of glass, an exceptionally hard material itself, a chunk of natural silicon carbide crystals easily cuts the glass. That's why lining materials of silicon carbide are so highly resistant to wear.

Close to the diamond in hardness, silicon carbide is the . . .

Most Versatile, Wear-Resisting Material

Unique among man-made materials, silicon carbide offers exciting possibilities in applications where severe wear is a problem. Resistance to impinging solids, to corrosion, and to heat shock are some of its features . . . along with high load-carrying capacity.

Even under the toughest conditions of wear known, our CARBOFRAX® silicon carbide refractories have repeatedly outlasted special alloys and other materials generally considered to be highly durable. *This applies to room-temperature applications as well as to others ranging to above 3000 F.* It applies to wear caused by rubbing or sliding, and to wear caused by impingement of sharp particles traveling at high velocities.

For example: *In coke chutes and hoppers that must withstand punishing cascades of sharp-edged coke . . . in hot blast mains, blast furnace downcomers, and cyclone dust collectors where abrasive dust is entrained in high-velocity gases . . . in reheating furnaces where metal slabs are pushed over skid rails or directly across the floor.*

CARBOFRAX refractories are made in various thicknesses

— are available as special, close-tolerance shapes, and as standard brick. They can also be supplied with interlocking joints. The coupon below will bring complete information. Why not check up? See how this unusual material can give real "armor-plate" protection.

CARBORUNDUM

Registered Trade Mark

Dept. S-123, Refractories Division
The Carborundum Company
Perth Amboy, N. J.

Please send descriptive data to:

Name _____
Position _____
Company _____
Street _____
City _____ Zone _____ State _____



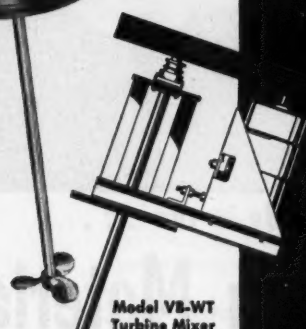
SOLVE YOUR MIXING PROBLEMS



Series C
Side Entering Mixer



Series C
Top Entering Mixer



Model VB-WT
Turbine Mixer



Series A
Side Entering Mixer

A tremendous variety of fluid mixing needs are ably handled by the complete line of Eastern Mixers. Size and power of mixers are flexible to help solve your problems. For complete information and engineering data, write for Eastern Fluid Mixing Catalogs. Eastern engineers are always available to work out your complex mixing problems with you.



Eastern INDUSTRIES, INC.
Dept. D, Regent St., Norwalk, Conn.

When inquiring check CP 5461 on handy form, pgs. 2-3

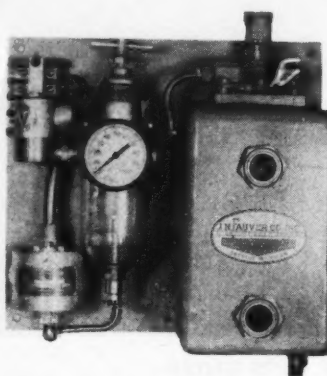
CONSTRUCTION

Constant, uniform oil film applied by automatic lube system . . .

operates solely on compressed air and has no moving parts

Uses: As a fully automatic oiling system for plain bearings, ball and roller bearings, vees, slides, ways, rollers, cams, chains, gears, and transmissions.

Features: System applies a constant and uniform oil film to groups of bearings. It has no moving parts, operating solely on compressed air. Unit atomizes oil into



Delivers lubrication to any point

microscopic particles which are carried in the air-stream and distributed through tubing to the bearings. Air circulates within and throughout bearing cavities.

Description: Lubrication is accomplished by compressed air entering unit at 100 psi, passing through regulator, where pressure is reduced to 10 psi. As air passes through venturi, it draws oil from reservoir. Amount of oil flow is adjustable.

Mixture of oil and air is thrust against a reclassifier which reduces oil to minute drops which in turn lubricate bearings. Constant flow of "Oil-Air" cools and protects bearings against abrasives and dirt while it lubricates.

System consists of solenoid valve, filter, water separator, regulating valve, lubricator, reservoir, pressure switch, and low-level indicator.

("Oil-Air" system is a product of J. N. Fauver Co., Inc., Dept. CP, 51 W. Hancock, Detroit 1, Mich. . . . or for more information check CP 5462 on handy form, pages 2 and 3.)

How the *Speedline* "TANGENTIAL FEATURE" cuts stainless piping costs

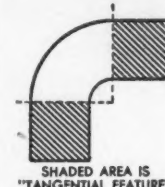
Now you can save up to 50% on corrosion-resistant lines by using light wall stainless pipe and versatile Speedline Fittings.

The added straight section of corrosion-resistant Speedline Fittings permits attaching unions or flanges without fouling . . .

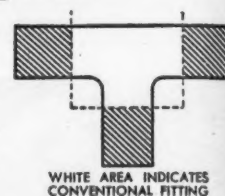
reduces number of welds required . . . simplifies installation . . . eliminates angle joints.

SEND FOR LATEST INFORMATION
Write a note on your company letterhead to get the complete story on the many cost-saving advantages of the Speedline System for process piping.

Speedline distributors are located in principal cities from coast to coast



SHADED AREA IS "TANGENTIAL FEATURE"



WHITE AREA INDICATES CONVENTIONAL FITTING

HORACE T. POTTS CO. Since 1815
502 E. Erie Avenue, Philadelphia 34, Pa.

When inquiring check CP 5463 on handy form, pgs. 2-3

Get Down to Your Working Vacuum

... Faster and at Minimum Over-all Cost!

You get speedier, more dependable "pump-down" with

BEACH-RUSS ROTARY VACUUM PUMPS

...and because of their superior mechanical efficiency they insure you against high maintenance costs and limited service life.

Type SS (upper) — for vacuum up to 5 mm on tight systems, for dry or semi-wet work. Capacities 6 to 375 c.f.m. Type RP (right) — for vacuum up to 10 microns or better on dry or wet work. Capacities 17 to 845 c.f.m.

WRITE FOR BULLETINS ON BOTH TYPES

BEACH-RUSS COMPANY
46 CHURCH STREET • NEW YORK 7, N. Y.

When inquiring check CP 5464 on handy form, pgs. 2-3

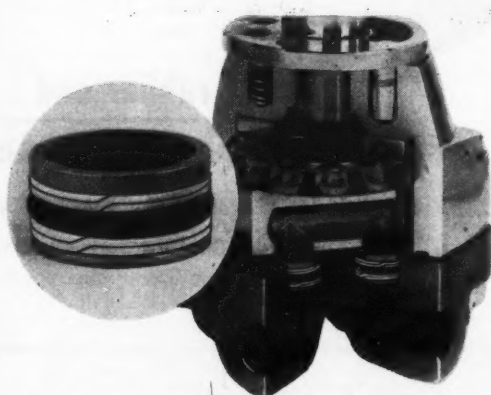
CHEMICAL PROCESSING

Longer life for O-ring seals with spiral back-up rings of tetrafluoroethylene

Uses: For aircraft and industrial use in protecting rubber O-ring seals indefinitely from extrusion, deterioration, or loss of efficiency.

Features: Designed for longer O-ring life, spirals protect O-ring from fatigue failure, decrease nibbling, prevent spiral failure, and allow use of spiral back-up and O-ring combinations at higher temperatures. With very low friction, the chemically inert spiral packings will not swell, shrink, harden or soften, and are unaffected by acids, oils, bases or solvents. Usable temperatures range from minus 110°F to 300°F.

Description: Designated series SR-6144, SR-7234, and SR-2619, spiral back-up rings have chamfered



Spiral back-up rings (inset) are available in 153 sizes

ends. Spirals with square ends are available in series S-6144, S-7234, and S-2619. Packaged on shipping mandrels they allow easy assembly and hold their shape in the free condition.

Spirals are available in 153 sizes ranging from 0.125 to 15.50" ID, and are interchangeable with AN6246 (6144), AN6244 (7234), and AN6219 (2619) back-up rings.

("SR" series of spiral back-up rings are products of W. S. Shamban & Co., Dept. CP, 11617 W. Jefferson Blvd., Culver City, Calif. . . . or for more information check CP 5465 on handy form located between pages two and three.)

Convenient wall chart covers fabrication of clad steels

Advanced techniques for fabricating clad steels are outlined on a convenient wall-mount chart which gives all basic information for arc-welding and flame cutting.

"Clad Fabrication Data" chart is available from Marketing Service, Lukens Steel Co., Dept. CP, Coatesville, Pa. When inquiring specify CP 5466 on handy form, pages 2 and 3.

In the petroleum industry . . .
it pays to install trouble free

ALLEN-BRADLEY MOTOR CONTROL

Over the years Allen-Bradley starters have established their reputation for being dependable and trouble free. Only ONE moving part—the absolute minimum of moving and wearing parts—guarantees millions of trouble free operations. Also, the double break, silver alloy contacts require no maintenance. These are important assets in starters in remote locations far removed from routine inspection.

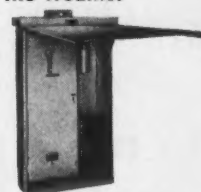
Incidentally, you can always find the right relay or starter enclosure in the Allen-Bradley line that will afford the maximum protection to your plant, personnel, and production schedules.

Really, you can't go wrong when you add "Allen-Bradley" to your motor control specifications.

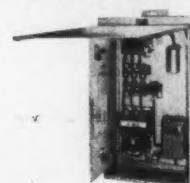
Allen-Bradley Co., 104 W. Greenfield Ave., Milwaukee 4, Wis.

Allen-Bradley Bulletin 712X Pump Control Panel of a unit pumper operated by the Cities Service Co., in Ector County, Texas.

Pump Control Panels
Provide for Complete
Protection against
the Weather



Bulletin 712X Pump Control Panels can be set to a pre-determined time schedule. All controls are mounted in an enclosure suitable for outdoor installation.



When the outer door of the enclosure is opened, only the lightning arrester and time clock are exposed. A second door (open here) covers the starting switch, fuses, and disconnect switch.



ALLEN-BRADLEY
SOLENOID MOTOR CONTROL

The Sign of Quality in Motor Control

When inquiring check CP 5467 on handy form, pgs. 2-3

It's new... it's
"NETONE"
 Filter Paper

- HIGH TENSILE STRENGTH
- HIGH BURST FACTOR
- ABRASION RESISTANT
- CREASE RESISTANT
- CHEMICAL RESISTANT

"NETONE" Filter Paper is a neoprene impregnated kraft paper that offers decided mechanical and chemical advantages over standard filter papers.

When compared to 60-pound unbleached kraft "NETONE" Filter Paper shows a 500% increase in wet tensile strength, wet burst factor increases from 6 to 57 and there is a marked increase in abrasion and crease resistance.

Write us about your requirements and we will be glad to send samples for your testing.

...And for your filter cloth requirements, we weave fabrics of VINCEL*, SARAN, DYNEL, NYLON, ORLON**, VINYLON N†, and GLASS. Samples sent on request.

Solution	60-Pound Kraft	Wet Strength Resin	Neoprene Treated (3%)
H ₂ O	0	72 hr.	86 hr.
10% HCL	0	6 min.	4 hr.
10% NaOH	0	6 hr.	72 hr.

*TM —Nat'l Filter Media Corp.

**TM —E. I. duPont de Nemours Co.

†TM —Union Carbide & Carbon Corp.

NFM Weavers of Industrial Filter Media for over Forty Years
The National Filter Media Corp.
 General Offices & Mills: New Haven 14, Conn.
 Western Office & Factory: Salt Lake City 1, Utah

Sales Offices—Representatives

Chicago, Ill. Cincinnati, Ohio Houston, Texas Oslo, Norway Johannesburg, South Africa
 2627 West 19th St. Roselawn Center Bldg. 2406 Second National Bank Bldg. Nicolai Friis Edward L. Baleman

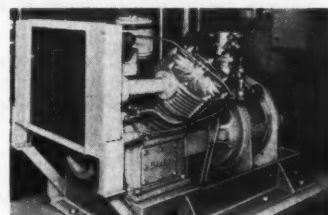
When inquiring check CP 5468 on handy form, pgs. 2-3

CONSTRUCTION

Stationary air compressor for general industrial applications

This stationary air compressor for general industrial applications has a displacement of 128 cfm. It is directly connected to a 25 hp electric motor and is available with constant speed or start-and-stop push-button controls as desired.

Unit is of V-type design with one 7-3/8" low pressure cylinder and a 4-3/8" high pressure cylinder. Stroke is 4 1/2". It is furnished complete ready for mounting on sub-base.



Unit is of V-type design, with displacement of 128 cfm

Standard equipment includes inter-cooler with safety valve, air cleaners, air pressure regulator and unloaders, motor starter and controls. Compressor is 62" long, 38" wide, 38" high, and weighs 1635 lb.

(Model 25D compressor is a product of Davey Compressor Co., Dept. CP, N. Water and Cook St., Kent, Ohio... or for more information check CP 5469 on handy form, pages 2 and 3.)

Describes nipple chuck for pipe conversion

Envelope enclosure describes company's nipple chuck. Folder stresses how easily short lengths of pipe can be converted into usable nipples with use of unit.

Finished nipples are removed from chuck by hand. No tools are required. Entire outfit, including several sized adapters, are packed in a convenient, easy-to-carry kit box.

Folder on Universal Nipple Chuck is issued by Beaver Pipe Tools, Inc., Dept. CP, Warren, Ohio. When inquiring specify CP 5470 on handy form, pages 2 and 3.

ACE-HIDE



3-GAL. PAIL



1-QUART DIPPER

UNBREAKABLE
 RUBBER-PLASTIC
 3-GAL. PAIL

For handling corrosive solutions. Tough, resilient, practically indestructible. Made of a new synthetic rubber-base material called ACE-HIDE, unaffected by most acids and alkalis. Drip-proof spout pours easily directed stream. Graduated scale inside pail. ORDER NOW from your rubber goods distributor, or write us.

ACE rubber and plastic products

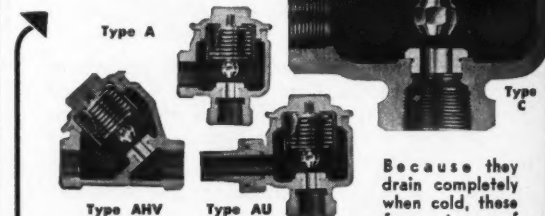
AMERICAN HARD RUBBER COMPANY

93 Worth St., New York 13, N. Y.

When inquiring check CP 5471 on handy form, pgs. 2-3

NICHOLSON MAKES FREEZE-PROOF Steam Traps

for Every Plant Use



Because they drain completely when cold, these four types of Nicholson steam traps are positively freeze-proof. Can be freely installed outdoors. Universally recommended for use in lines which need not be in continuous use during cold weather, because they are freeze-proof and because their 2 to 6 times average drainage capacity results in minimum heat-up time. The non-air-binding feature of Nicholson traps also notably facilitates heat transfer in severe weather. Sizes 1/4" to 2"; pressures from vacuum to 250 lbs.

BULLETIN 853
 181 Oregon St.
 Wilkes-Barre, Pa.

W. H. NICHOLSON & CO.
TRAPS • VALVES • FLOATS

When inquiring check CP 5472 on handy form, pgs. 2-3

**Same size plus 50% more power
with improved variable speed
transmission**

Uses: For variable speed drive applications.

Features: Unit is said to have improvements over previous models including 50% more power in approximately the same size, use of a two piece housing with integral base, improved control that provides linearity — equal changes in speed for equal changes in dial setting and cooler, more quiet operation.

Description: Improved power and performance are said to be achieved primarily by sloping tapered rollers downward from input end, instead of upward as formerly, thereby providing greater effective roller dimension in same space, simplified carrier construction, and increased efficiency.

Model 28 variable speed drive delivers all speeds from maximum to zero. Speed may be changed with transmission running or stationary. Drive incorporates built-in overload protection for both itself and driven machine in event of jam or excessive overload.

Transmission is furnished as standard with a micrometer control permitting easy adjustment to or between the 400 graduations. It may be set with accuracy to any desired setting and inherent dynamic bias of



Improved control provides linearity

transmission assures that any backlash in control gearing is taken up so that exactly the same speed will be obtained for any given setting. Transmission can be had in a mechanically reversing style in which all speeds from top to zero can be obtained forward and reverse without change in rotation.

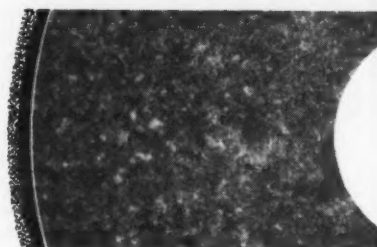
Unit is available with a wide variety of built-in reducer or step-up gearboxes including single and double reduction helical spur reducers and right angle worm gear units with output shaft horizontal or vertical. Built-in motors of all types (including explosion-proof) are available, as are a variety of controls including remote electrical, pneumatic, and remote mechanical.

(Variable speed transmission is a product of Graham Transmissions, Inc., Dept. CP, Menomonee Falls, Wis. . . . or for more information check CP 5473 on handy form, pages 2 and 3.)

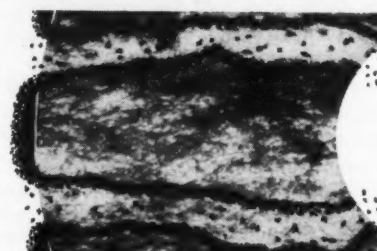
GRADUATED DENSITY

**makes MICRO-KLEAN the most
effective filter on the market!**

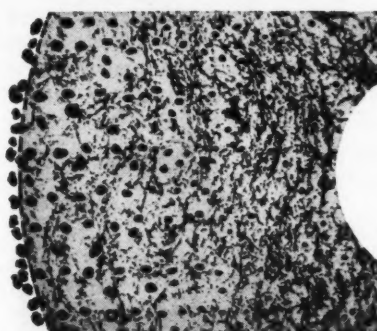
*How MICRO-KLEAN compares with
other cartridge filters*



**Compare MICRO-KLEAN with
FILTERS WITH THE SAME DENSITY
THROUGHOUT.** The filter media density is the same on the pressure and discharge surfaces of the element; therefore, dirt accumulation is largely on the outside surface, choking the cartridge ("plastering") and reducing the effective filter life.



**Compare MICRO-KLEAN with
FILTERS WITH HAPHAZARD DISTRIBUTION OF FILTER MEDIA.** Uneven haphazard media density permits fluid to find channels through the filter, and pass solids larger than the minimum filter spacing.



**Now Look at the advantages
offered by MICRO-KLEAN.** See how the fibre density increases toward the discharge side of the MICRO-KLEAN filter cartridge? In effect, every Cuno MICRO-KLEAN cartridge is an infinite multiplicity of screens, ranging from relatively coarse on the outside down to 10 microns in the center. Because of MICRO-KLEAN's graduated density in depth, particles are entrapped within the entire depth of the filter element, giving the cartridge a much longer effective life. Standard cartridge size is 9 3/4" long by 2 3/4" O. D., in densities of 10, 25 and 50 microns.

MICRO-KLEAN gives you

- greater dirt holding capacity
- absolute protection against rupturing or channeling of the cartridge
- longer effective cartridge life

REMEMBER . . . IF YOU CAN PUMP IT, CUNO CAN FILTER IT

M.3.C



MICRO-KLEAN FILTERS BOOST PRODUCTION IN CHEMICAL PLANTS

**Fewer Cartridge Changes Necessary
with MICRO-KLEAN**

When you have to shut your fluid flow system down in order to clean a filter or replace a cartridge, you lose valuable production time. If you are troubled with this problem, it would pay you to investigate Cuno's MICRO-KLEAN filters.

MICRO-KLEAN's graduated density-in-depth allows greater capacity for dirt accumulation within the micronic cartridge, giving you twice the effective life of an ordinary filter cartridge. Thus cartridge replacement costs are cut in half.

And the high porosity of MICRO-KLEAN permits high flow rates, enabling you to speed up fluid processing. MICRO-KLEAN's compact, specially engineered construction affords simplicity of installation and maintenance. Changing cartridges can be accomplished in a few seconds—only one nut has to be removed.

Each fibre of the MICRO-KLEAN filter is positively bonded in position by resin impregnation and polymerization. This provides great structural strength and complete protection against channeling, rupturing, shrinking and distortion.

Cuno's exclusive method of felting fibres permits precision control of the cartridge structure, assuring MICRO-KLEAN users of consistent, uniform filtration.

Take advantage of Cuno's unique "money-back" offer: if MICRO-KLEAN doesn't outperform any filter cartridge you have previously used, we'll send you double your money back. Send coupon today for MICRO-KLEAN bulletin. M.3.3

Cuno Engineering Corporation
Dept. 163M South Vine Street, Meriden, Conn.

I'm interested in your "money-back" offer.
Please send me more information on MICRO-KLEAN for and enclose
(fluid) your free filtration analysis form.

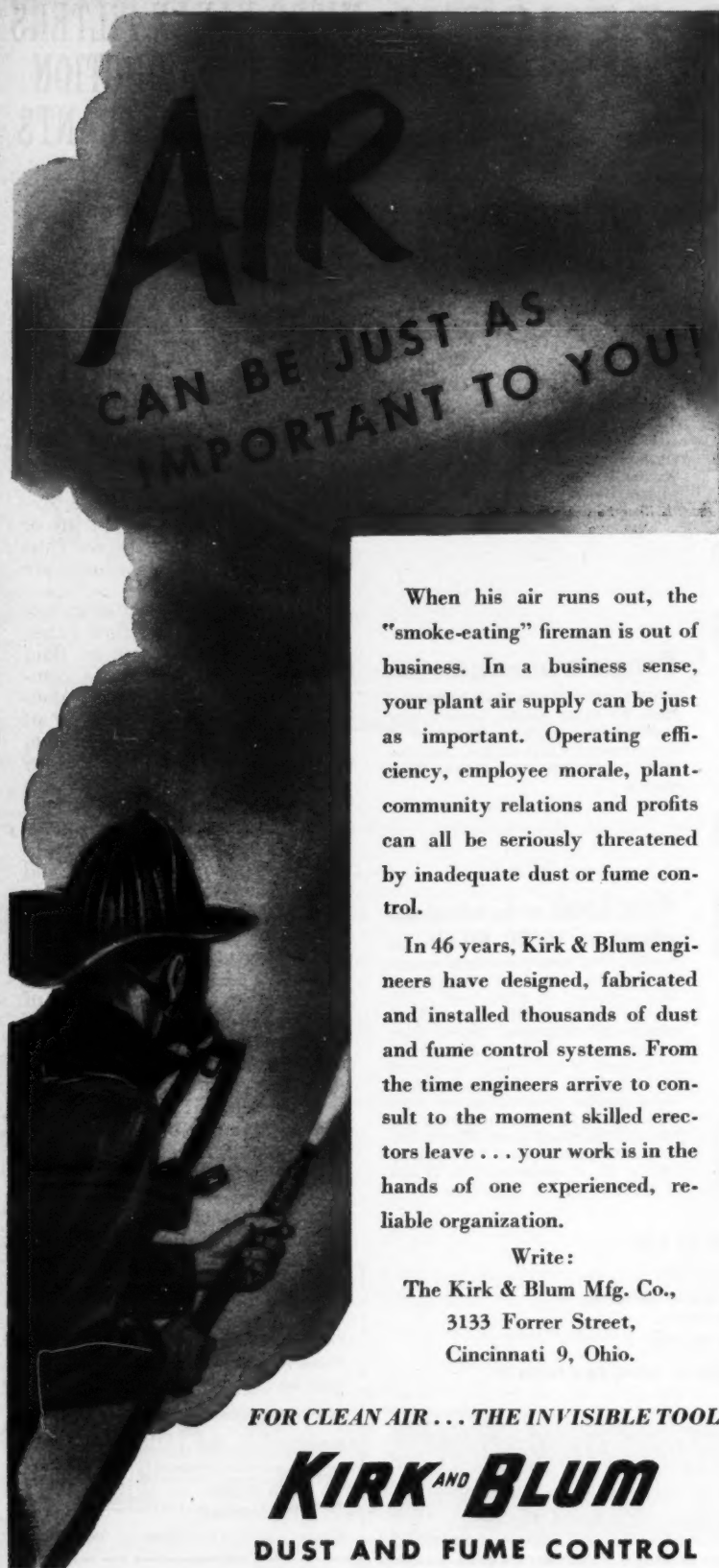
Name

Company

Address

City Zone State

When inquiring check CP 5474 on handy form, pgs. 2-3



When his air runs out, the "smoke-eating" fireman is out of business. In a business sense, your plant air supply can be just as important. Operating efficiency, employee morale, plant-community relations and profits can all be seriously threatened by inadequate dust or fume control.

In 46 years, Kirk & Blum engineers have designed, fabricated and installed thousands of dust and fume control systems. From the time engineers arrive to consult to the moment skilled erectors leave... your work is in the hands of one experienced, reliable organization.

Write:

The Kirk & Blum Mfg. Co.,
3133 Forrer Street,
Cincinnati 9, Ohio.

FOR CLEAN AIR... THE INVISIBLE TOOL

KIRK AND BLUM

DUST AND FUME CONTROL

When inquiring check CP 5475 on handy form, pgs. 2-3

CONSTRUCTION

**Vacuum cleaning unit
is sealed against
water damage...**

continuous operation permitted
by separate cooling system

Uses: For maintenance use in industrial plants, commercial buildings and similar applications.

Features: Portable cleaner is equipped with a universal type AC/DC, 115 v motor, sealed against water damage and fitted with a separate cooling system for continuous operation.

Description: Dimensions of the unit, designated P-909, are: height 21½"; diameter, 14½". Weight is 32 lb. It generates an air flow of 74 cu ft/min and a vacuum water lift of 42". Dry tank capacity is 1-¾ pecks; liquid capacity is 3-¾ gal. Unit's four casters have rubber tread and top swivel bearings for effortless rolling. A protective rubber bumper surrounds cleaner base to safeguard furniture and walls. Finish is two-tone gray; fittings are chrome-plated.

A number of standard cleaning tool attachments are furnished with the unit, including an 8 ft braided rubber hose with adapter, steel floor rod for connecting tools to hose, floor and rug nozzle, bare floor and wall brush, crevice tool,



Furnished with standard attachments

utility and upholstery nozzle and a slide-on brush. Also available

R/M Teflon*

PACKINGS for the chemical industry

The R/M Teflon Packing line includes solid rings, Vee-Flex® rings, braided and plastic packings, solid spacers and adapters, packings for stuffing boxes and valve stems, "envelope" gaskets, solid gaskets in round, square and irregular shapes. Teflon is inert to all commercial chemicals. If you fabricate special parts like pump impellers and valve discs, order R/M Teflon rods, sheets and tubes to your own specifications. Write for catalog.

*Du Pont trade-mark for its tetrafluoroethylene resin



PACKINGS

RAYBESTOS-MANHATTAN, INC.

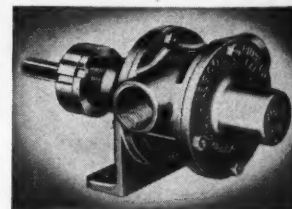
PACKING DIVISION, MANHEIM, PA.

When inquiring check CP 5476 on handy form, pgs. 2-3

JABSCO STAINLESS STEEL PUMPS SOLVE CORROSIVE PUMPING PROBLEMS

Designed and Engineered
for Chemical Applications

Jabsco's complete line of self-priming, corrosion-resistant pumps answer a multitude of pumping needs. Models 2810 (1" pipe size), 2870 (½"), and 2690 (¾") have all metallic parts of Type 316 stainless steel. Shafts are supported by oversize, replaceable carbon bearings, stuffingbox type shaft seal with chemical resistant packing. Pumps function perfectly even with dry suction lifts approaching 15', no foot valve is required. When primed, they suck as high as 26'. Jabsco pumps have no metal-to-metal contact, no gears to wear or become noisy. The exclusive "camflexed" Neoprene Impeller is the only moving part. This tough, long-lived, wear resistant impeller is self-lubricated by the liquid pumped. Jabscos are economical, low in first cost, and trouble and maintenance free, even under continuous operation. May be mounted at any angle to pump thin or viscous liquids, and can be operated efficiently at low or high speeds. At 10' head and 1750 RPM, Model 2810 delivers up to 27 GPM, Model 2870 up to 10 GPM, Model 2690 up to 4 GPM. Other stainless steel models also available with ball bearings and mechanical seals. For complete information on how Jabsco can solve your pumping problems, write **Jabsco Pump Company**, 2031 North Lincoln Street, Burbank, California.



When inquiring check CP 5477 on handy form, pgs. 2-3

CHEMICAL PROCESSING

CONSTRUCTION

is a kit of tools for conversion of machine to wet pick-up equipment. (Product of Dept. KP, Premier Co., Dept. CP, 755 Woodlawn Ave., St. Paul 1, Minn. . . or for more information check CP 5478 on convenient Reader Service slip between pages two and three.)

Horizontal and opposite pipe connections on steam trap

Side-inlet, side-outlet steam trap with 1" or 1 1/4" threaded connections meets demands of larger size in traps with horizontal and opposite pipe connections. Body and



Capacities range to 6800 lb/hr; pressures to 250 psi

cap are cast semi-steel; valve and seat, hardened chrome steel; interior trim, stainless steel. Capacities range up to 6800 lb/hr, depending on pressure; pressure range is 0 to 250 psi. Height of unit is 13-5/8", diameter 9", and weight is given as 45 lbs.

(Product of Armstrong Machine Works, Dept. CP, Three Rivers, Mich. . . or for more information check CP 5479 on handy form, pages 2 and 3.)

For more information on product at right, specify CP 5480 . . . see information request blank between pages 2 - 3.



FILTER BAGS OF ORLON OUTLAST OTHERS 2 TO 1 AT SMELTING PLANT

Violent automatic shaking and corrosive smoke at temperatures of 250°F. cut the service life of ordinary filter bags to six months in a large smelting firm's smoke-control units. Repairs were frequent and costly . . . until the plant superintendent tried filter bags of "Orlon".

He found that filter bags of "Orlon" acrylic fiber lasted over a year in this severe service—*more than twice as long as the bags previously used.* Yet their purchase price was substantially less! This combination of long life and economy caused the superintendent to recommend filter bags of "Orlon" for all of the firm's smoke-control units.

That's the experience of R. Lavin & Sons, Inc., smelters and refiners of brass and bronze ingots, whose two smelting plants in the Chicago area are currently using large numbers of filter bags of "Orlon". Tons of valuable zinc oxide are recovered by the bags each month. The job of filtering is so thorough that stack emission is 99% clear—a great step forward in this firm's community relations.

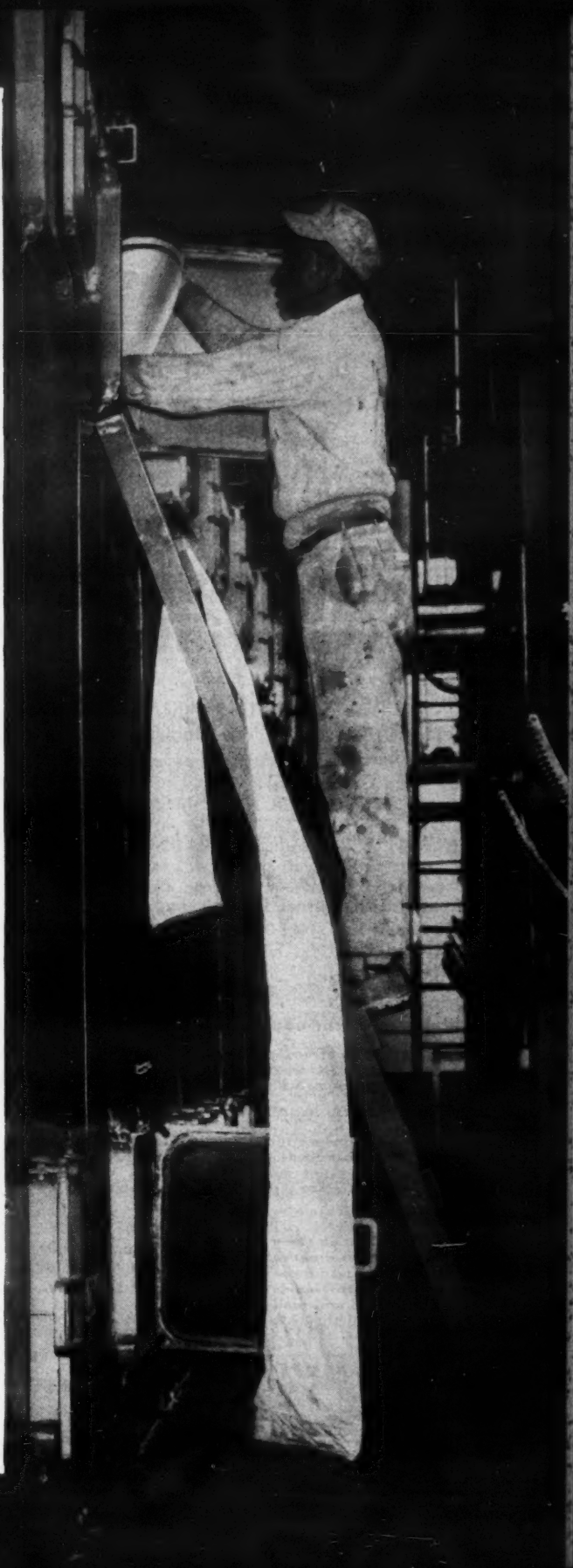
Here, as in so many cases, the remarkable properties of "Orlon" mean greater efficiency, longer service. For "Orlon" resists heat and corrosion . . . retains its strength under conditions that cause ordinary fibers to deteriorate. Perhaps "Orlon" can help you improve a product or production process.

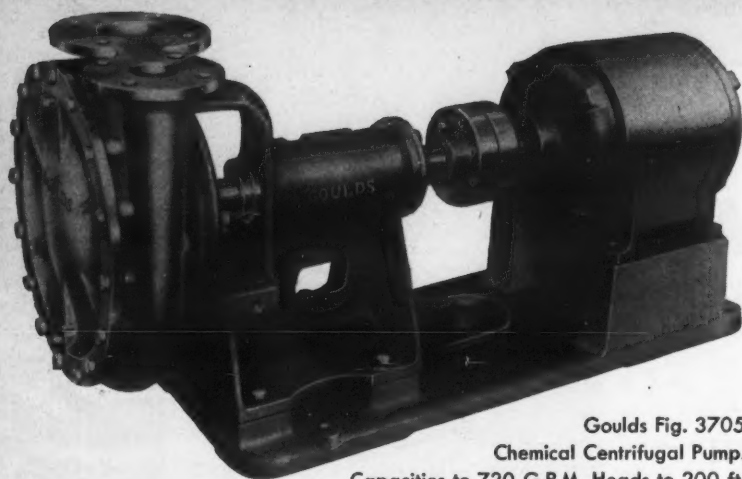
For a list of filter-equipment manufacturers using "Orlon" and for other information, write: E. I. du Pont de Nemours & Co. (Inc.), Room N-2522-P, Wilmington 98, Delaware.

ORLON is Du Pont's trade-mark for its acrylic fiber.



BETTER THINGS FOR BETTER LIVING . . . THROUGH CHEMISTRY





Goulds Fig. 3705
Chemical Centrifugal Pump.
Capacities to 720 G.P.M. Heads to 200 ft.

Now available in these 8 different materials!

You know the Goulds Fig. 3705 as the pump that is saving chemical plants thousands of dollars in handling corrosive liquids such as acids and alkaline liquors.

You've asked if it could be supplied in materials other than stainless steel 316 and FA-20. Here's the answer:

You can now take your choice of these eight different materials:

- | | |
|--------------------------|--|
| 1. Stainless steel 316 | 6. Bronze fitted |
| 2. Stainless steel FA-20 | 7. All iron,
stainless steel trim |
| 3. Stainless steel 304 | 8. All bronze,
stainless steel trim |
| 4. All iron | |
| 5. All bronze | |

And you can take advantage of these four saving benefits:

- | | |
|--|--|
| a. Long packing life and freedom from leakage—Stuffing box on suction side of impeller means pressure is limited to suction head. | c. Impeller clearance adjustable for wear—By loosening and sliding end cap along shaft you expose locking collar on outboard ball bearing, permitting you to readily adjust impeller position. |
| b. Easy cleaning and inspection—Suction and discharge connections in casing permit removal of casing cover and impeller without disturbing piping. | d. Low parts inventory—Interchangeable parts permit you to keep inventories down and prevent excessive down-time. |

To get full information on these new materials, plus performance curves, specifications and dimensions, contact your nearby Goulds representative, or clip and mail the coupon for new Bulletin 725.3.



GOULDS PUMPS, INC.
Dept. CP, Seneca Falls, N. Y.

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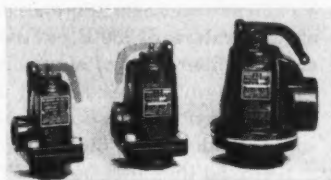
CONSTRUCTION

**Non-corrosive materials
used in larger valves
for pressure service**

Uses: These two larger size pressure relief valves are for use on hot water space heating boilers to protect against over pressure.

Features: All operating parts of valves are of non-corrosive materials. Valve seat proper, or orifice, is of brass. High temperature silicone is used for valve disc.

Description: Catalogued as the 1" No. 230 and the 1½" No. 230, valves were developed for hot water boilers with heat output to 743,400



Shown from left to right are original No. 230 ¾" and larger 1" and 1½" models

Btu/hr and 1,025,100 Btu/hr respectively. Original ¾", No. 230 valve of manufacturer's line has a capacity of 303,000 Btu/hr. All valves are designed to open at 30 lb pressure.

Valves are tamper-proof, with pressure settings established at factory. Independent-action testing lever cannot interfere with automatic action of valve even if tied down. Each valve can be easily disassembled for inspection or servicing by removing four screws.

(Products of McDonnell & Miller, Inc., Dept. CP, 3500 N. Spaulding Ave., Chicago 18, Ill. . . . or for more information check CP 5482 on convenient Reader Service slip between pages 2 and 3.)

Presents entire line of pipe tools

Condensed, eight-page, quick-reference catalog covers manufacturer's entire line of pipe tools from threaders to cutters.

Condensed catalog is issued by Beaver Pipe Tools, Inc., Dept. CP, Warren, Ohio. When inquiring specify CP 5483 on handy form, pages 2 and 3.

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"HI-TEMP"
C-5 THREAD COMPOUND
IS BEST FOR ALL STUD THREADS
and STAINLESS STEEL APPLICATIONS

✓ speeds up dis-assembly time
✓ prevents stud breakage
✓ eliminates pitting of stainless steel

NO MORE FROZEN
OR GALLED STUDS
EVEN AT
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Let us SEND you a
FREE SAMPLE
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that C-5 will lick your toughest
stud breakage problems!

To assure easy maintenance on products having threaded assemblies many leading product engineers have specified the use of Fel-Pro C-5 as an anti-seize coating on stud threads prior to final production line assembly. Fel-Pro's exclusive Colloidal-Copper formula allows for easy separation and reduces stud breakage of threaded assemblies after long exposure to extreme temperatures. It eliminates pitting of stainless and alloy steel even where dissimilar metals are joined. Conduct your own tests with C-5 "Hi-Temp" at our expense. Write for Free Sample and complete data sheet TODAY!

FEL PRODUCTS MFG. CO. 1515 Carroll Ave., Chicago 7, Ill.

When inquiring check CP 5484 on handy form, pgs. 2-3

LOGAN AIR AND HYDRAULIC POWER
SPEEDS • COORDINATES • REFINES PRODUCTION
IN OVER 10,000 INDUSTRIAL PLANTS

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AIR-DRRAULIC® FEED-CONTROLLED CYLINDERS

COMBINES
the fast-acting, economical
low-pressure operation of
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OIL

5 STANDARD MOUNTING TYPES
Standard bores from 3" to 8". Standard strokes to 5'.

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Let Logan Engineers help you design your Air and Hydraulic Circuits.

LOGANSPORT MACHINE CO., INC.
835 Center Avenue Logansport, Indiana

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When inquiring check CP 5485 on handy form, pgs. 2-3

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If you are responsible for processing operations in an administrative capacity as plant superintendent, chemical engineer, chemist, engineer or equivalent responsibility . . . in a plant of substantial operations* where chemical processing is an important factor . . . CHEMICAL PROCESSING will be sent to you without charge or obligation if you request it. Use form below. In requesting, be sure to answer all questions. If your firm is not rated or listed in standard references, indicate size of the company by capacity, annual sales or number of employees. Unless all information is given, magazine will not be sent.

*"Substantial operations" does not necessarily mean an extremely large plant. But requests for the magazine exceed supply so we must set standards to insure publication being sent where it can be used to best advantage.

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DECEMBER, 1953

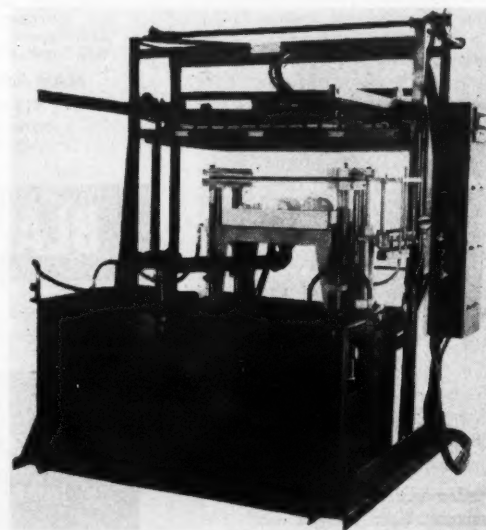
CONSTRUCTION & MAINTENANCE

Automatic cycle operation featured on vacuum forming machine for plastics fabrication

Uses: In the vacuum forming technique for plastics fabrication, suitable for use with either male or female molds. Unit is said to permit easy and successful application of process for thermoplastic sheets in manufacture of packagings, and a wide variety of industrial parts and products.

Features: Machine features completely automatic cycle operation and 90° adjustable platen for differential heating of plastic sheet.

Description: Model 50-20 machine has welded steel construction; 60 x 30" platen to handle sheets up to 52 x 24" in size; height-adjustable strip heater assembly that provides temperatures up to 1150°F;



Designed to permit easy and successful application of vacuum forming process

100 gal vacuum surge tank; and cycle control by means of four delay timers. Unit weighs about 2500 lb, and overall dimensions are: height, 88"; width, 70"; and depth, 68".

(Vacuum forming machine is a product of Vacuum Forming Corp., Dept. CP, Port Washington, N. Y. . . or for more information check CP 5486 on handy form, pages 2 and 3.)

Symposium on conditioning and weathering

Compiled to promote an understanding of the importance of conditioning and weathering in the assessment of materials of engineering, this symposium contains 10 reports covering the field. Copies of Symposium on Conditioning and Weathering can be obtained by remitting \$2.25 the copy direct to American Society for Testing Materials, 1916 Race St., Philadelphia 3, Pa.

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"LITHOFORM"® makes paint stick to galvanized iron and other zinc and cadmium surfaces.

"ALODINE"® the new ACP protective coating chemical for aluminum, anchors the paint finish and protects the metal.

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"PERMADINE"®, a zinc phosphate coating chemical, forms on steel an oil-adsorptive coating which bonds rust-inhibiting oils such as "Granoleum."

"THERMOIL-GRANODINE"® a manganese-iron phosphate coating chemical, forms on steel a dense crystalline coating which, when oiled or painted, inhibits corrosion.

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The oiled "THERMOIL-GRANODINE" coating on pistons, piston rings, cranks, camshafts and other rubbing parts, allows safe break-in operation, eliminates metal-to-metal contact, maintains lubrication and reduces the danger of scuffing, scoring, galling, welding and tearing.

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"GRANODRAW"® forms on pickled surfaces a tightly-bound adherent, zinc-iron phosphate coating which facilitates the cold mechanical deformation of steel, improves drawing, and lengthens die life.

Send for descriptive folders and Government specifications chart on the above chemicals. Write or call for more information on these products, and advice on your own metal-working problem.

AMERICAN CHEMICAL PAINT COMPANY

General Offices: Ambler, Penna.

Niles, Calif.

Detroit, Mich.

Windsor, Ont.

When inquiring check CP 5487 on handy form, pgs. 2-3

To manufacturers who have dust problems...this announcement is of the utmost importance.

DAY Type "AC" (reverse jet) Dust Filters are now being furnished with SELF-ADJUSTING BLOW RINGS, made under DAY and Hersey patents. This DAY improvement, to an already efficient dust filter, is now offered to industry after months of study and operation.



Wool felt and probably any other material with similar efficient filtering characteristics is inherently dimensionally unstable. DAY'S SELF-ADJUSTING BLOW RINGS automatically compensate for any variation in the filter tubes due to changes in temperatures, pressures, moisture conditions, etc. They assure perfect ring to cloth contact.

If you have a dust problem write to DAY for Bulletin 528-R.

The DAY Company

852-3rd Avenue N.E. • Minneapolis 13, Minnesota
IN CANADA: P.O. Box 70Y, Ft. William, Ont.
Branch Plants in Buffalo, Ft. Worth and Welland, Ont.



When inquiring check CP 5488 on handy form, pgs. 2-3

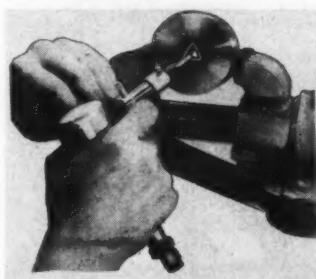
CONSTRUCTION

Carbide dies repaired, altered, produced by vibrationless unit

Uses: For repairing or working carbide dies.

Features: Unit is said to be vibrationless, even when used at long stroke which may be adjusted from 0 to .025".

Description: Accuracy is reportedly due to full ball bearing construction and eccentric balancing design. Unit, called the Di-Profilor, is said to be as much as fifty times faster than working by hand. Action is reciprocating or



Works 50 times faster than by hand

oscillating at will to the amount desired, and when used with spindle attachment, finely controlled rotary action is also obtained.

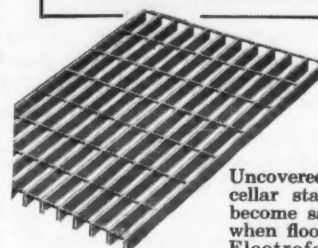
(Di-Profilor is a product of Nord International Corp., Dept. CP, P.O. Box 44-N30, Denville, N. J. . . . or for more information check CP 5489 on handy form, pages 2 and 3.)

Information on chains, sprockets, bushings

Twenty-four-page selection guide covers manufacturer's line of roller chain, sprockets and bushings. Data includes cross-sectional drawings, dimensions (chains, sprockets, & bushings), weights, service factors, maintenance information, hp ratings, center distances and speed ratios, and installation, adjustment and lubrication specs.

Bul A-624 is issued by Dodge Mfg. Corp., Dept. CP, Mishawaka, Ind. When inquiring specify CP 5490 on handy form, pages 2 and 3.

Make those OPEN SPACES SAFE and USABLE with this unique, one-piece OPEN STEEL FLOORING



**SILENT!
STRONG!
SECURE!**

Uncovered pits, light wells, cellar stairways, etc. quickly become safe and usable areas when floored with Blaw-Knox Electroformed Steel Grating.

Made in one piece . . . no nuts or bolts to rattle or lose. Provides safe footing even when wet or greasy and lasts indefinitely. Admits maximum light and air. Furnished in any shape, cut to fit. Just send dimensional sketch of area to be covered and we will forward price by return mail.

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2076 Farmers Bank Building, Pittsburgh 22, Pa.
Sterling 1-2700

ELECTROFORMED® STEEL

BLAW-KNOX GRATING

When inquiring check CP 5491 on handy form, pgs. 2-3

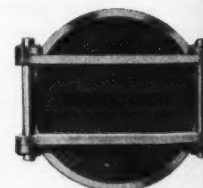
THE NEW LENAPE-LACY
quick opening
tight sealing
MANWAY

Remove one pin—and swing it open! Close—drop the pin in place—it's sealed!

Here is a manway that can be opened in a few seconds—yet can't open accidentally. The Lenape-Lacy design also provides positive sealing which seats more tightly with increasing pressure; and the molded gasket of Hycar or Silicone rubber can be instantly removed and quickly replaced. A lip protects the gasket seat from damage.

Four frame styles are available for all normal mounting conditions in sizes (ID) of 16", 18", 20", 24", and 30" in service ratings of 150 lb., 300 lb., 400 lb., and 500 lb. Also available for pressure-vacuum cycle service.

Write today for Bulletin 523 which describes the Lenape-Lacy Quick Opening Manway in detail.



When inquiring check CP 5492 on handy form, pgs. 2-3

CHEMICAL PROCESSING

Removes all non-condensable gases from boiler feedwater . . .

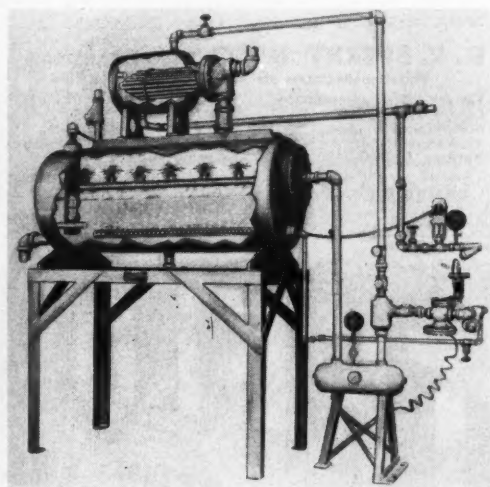
system integrates condensation recovery, water storage, deaeration, and boiler feeding

Uses: For deaeration of feedwater for boilers.

Features: Unit is said to effectively remove oxygen down to .005 cc/l, and other non-condensable gases from boiler feedwater. This fully vented deaerator system integrates condensation recovery, deaeration, water storage, and automatic boiler feeding.

Description: Deaerator provides external pre-heating to a temperature above boiling point with over-atmospheric pressure held only up to the sprayer manifold; storage receiver itself is operated fully vented at only atmospheric pressure.

Pre-heated water is delivered with an explosive flash-down action through multiple spray nozzles. Flash-down from finely divided particles of super-



Removes oxygen down to .005 cc/l

heated water releases dissolved oxygen and other non-condensable gases. With no restrictive vent these gases escape through a vent condenser.

(Zero-oxygen Deaerators are a product of Fred H. Schaub Engineering Co., Dept. CP, 2110 S. Marshall Blvd., Chicago 23, Ill. . . or for more information check CP 5493 on handy form, pages 2 and 3.)

Reports on viscosity and density of lubricating fluids

Comprehensive data on viscosity and density of more than 40 lubricating fluids at temperatures from 32 to 425°F and at pressures up to 150,000 psi are contained in two volumes entitled "Pressure-Viscosity Report" which are available by remitting \$10.00 direct to Research Dept., the American Society of Mechanical Engineers, Dept. CP, 29 W. 39th St., New York 18, N. Y.

A revolutionary new principle in Coolers . . .

THE holo-flite^{*} PROCESSOR

(HOLLOW-FLITE)

Backed by the same well-known organization that pioneered COTTRELL Precipitators, MULTICLONE Collectors and other leading products, the HOLO-FLITE Processor represents a far-reaching advancement in the science of heat-exchanger design. Widely adaptable to various types of cooling and similar applications in industrial processing operations, the HOLO-FLITE handles powdered or granular solids, moist pastes or slurries with equal facility. Moreover, it requires as little as 1/5th the space of other heat exchangers . . . causes no dust, therefore requires no costly or complicated auxiliary recovery equipment . . . and maintains its uniformly high efficiency under modern continuous-flow operations (no stop-and-go "batching" operations are necessary).

**Unique Simplicity**

Basically, the HOLO-FLITE consists of two or more hollow intermeshing conveyor screws that slowly rotate in a trough or tube. The cooling agent circulates through the hollow flights and shafts of the conveyor screws while the product itself "flows" in the trough where it is constantly rotated into, around, over and under the moving heat-exchange surfaces. The continuous mixing, turning, folding action causes a constant change of contact with the heat-exchange surfaces and results in a high rate of heat transfer. Yet the action is so gentle that there is no dusting and little, if any, abrasion of crystalline particles.

Unlimited Capacity

HOLO-FLITE Processors can be readily adapted to virtually any capacity requirement and are in daily operation on such varied products as sand, cement, cottonseed cake, soybean meal, borax, salt, sugar, baby foods, and many other products. Cooled products can be packaged directly from the HOLO-FLITE discharge, saving time, space and additional handling.

Be sure to investigate HOLO-FLITE savings before you install heat-exchange equipment. To insure maximum operating efficiency at low overall cost, each installation is individually engineered to the job using basic stock-size elements. Contact the nearest Western Precipitation office for further details on the revolutionary HOLO-FLITE Processor—or write direct!



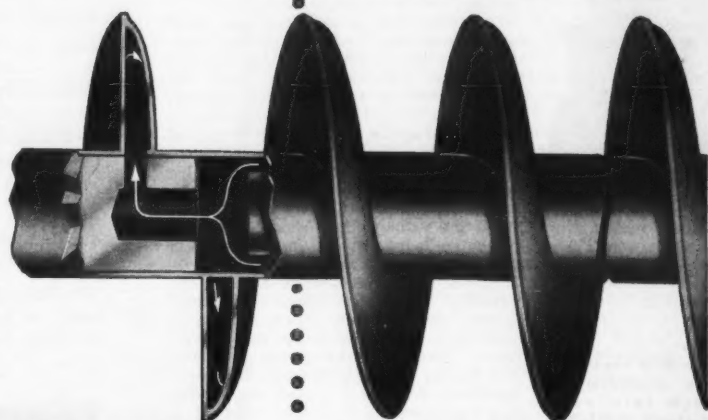
FREE! New 8 Page Bulletin describing HOLO-FLITE features and applications will gladly be sent on request!

*Reg. T.M.

► **Handles Pastes, Sludges or Solids!**

► **Up to 80% Saving in Space!**

► **Permits Continuous, High Efficiency Operation!**

**A FEW OF MANY HOLO-FLITE ADVANTAGES**

WIDE ADAPTABILITY: HOLO-FLITE handles fine-grained, crystalline or powdered solids, pulps, pastes and slurries with equal ease. Heat transfer agent can be refrigerant, cooled or ambient water, or other fluids to provide a wide range of processing temperatures.

SPACE-SAVING COMPACTNESS: Because of its large active heat-transfer surface per cubic foot of space required, the HOLO-FLITE requires only a minimum of space—is 5 to 6 times as compact as other equipment of comparable capacity!

LOW POWER REQUIREMENTS: HOLO-FLITE conveyor screws rotate slowly—usually only 1 to 12 r.p.m. Further, multiple tiers can be driven by one motor, assuring low power consumption.

INSTALLATION FLEXIBILITY: The basic HOLO-FLITE unit is two intermeshing screws in a single trough, but four or six screws per trough can also be installed. Moreover, any number of troughs can be "tiered" on top of one another—trough lengths can be varied from 8 to 20 ft.—screw diameters can be varied from 7" to 16"—to provide virtually any desired capacity in a minimum of space!

Write for full details on the many savings the HOLO-FLITE Processor can bring to your particular applications.

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 PRECIPITATION CO. OF CANADA, LTD., DOMINION SQ. BLDG., MONTREAL

When inquiring check CP 5494 on handy form, pgs. 2-3

Your straining problem easily solved with a

KINNEY Self-cleaning STRAINER

Automatic or manually operated



Many varieties of straining media are available — one for each individual specification.

Our field engineers are available to look into your problem and offer expert advice.

Whatever your particular straining problem may be, the Kinney Automatic and the Kinney Manually-Operated Self-Cleaning Strainers provide for dependable and satisfactory service. Manufactured in 2" to 36" pipeline sizes, these strainers are made from heavy duty cast iron or cast steel. They will remove fine suspended particles from river, well, or process water and dispose them in a self-cleaning manner. Installation of a synthetic seal assures a positive separation between the dirty and clean liquid. Units are also constructed from special non-corrosive materials for straining chemicals, gasoline, oil, ammoniacal liquor, sea water, pulp and paper stock, and various other liquids. Excellent results are being achieved in many types of industries.

With the Kinney Automatic Strainer, the straining media are effectively cleaned through the backwash section as soon as there is a slight increase in the pressure drop. Operation is completely automatic. The Kinney Manually-Operated Strainer is specifically designed to replace troublesome basket strainers. A simple twist of a ratchet at the top of the strainer cleans the straining media within a few minutes.

S. P. KINNEY & ENGINEERS, Inc.

CARNEGIE, PENNSYLVANIA

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Please send complete sample Paint Roller Kit—9 inch size. Includes tray —\$5 payment enclosed ☐

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CONSTRUCTION & MAINTENANCE

Advantages for smaller installations with 75 to 200 ton centrifugal refrigerating machines

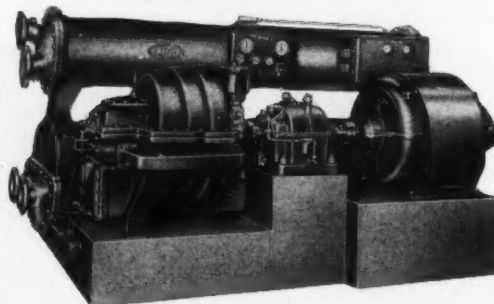
Uses: For applications in smaller installations of air conditioning or industrial refrigeration.

Features: Advantages claimed for unit include long machine life at high efficiency, compactness, and automatic response to cooling load.

Description: Small 75 to 200 ton centrifugal can be connected to any type of drive desired — electric motor, diesel, or steam turbine. It can be adapted to automatic constant speed with synchronous motors so that building or plant power factor correction can be furnished.

Operating speeds can be selected for normal operation with above-normal condensing temperatures. This feature may be used to reduce condenser water consumption by as much as 40 or 50% in some areas.

Impeller wheels which provide centrifugal force are made of lead-coated alloy steel. This type of construction is said to prevent wheel failure by corrosion



Can be connected to any type of drive desired

or vibration. Separate water heads of cast iron for corrosion resistance are used on both condenser and cooler to permit easy access for inspection and servicing.

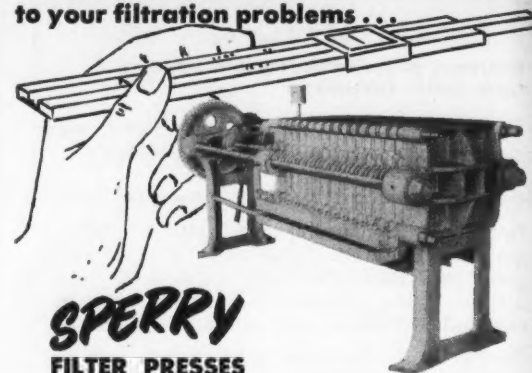
(Refrigerating machine is a product of Carrier Corp., Dept. CP, 300 S. Geddes St., Syracuse, N. Y. . . . or for more information check CP 5497 on handy form, pages 2 and 3.)

Depicts variety of custom built stainless steel storage tanks

Among the many custom built stainless steel storage tanks illustrated in 4-page bulletin are single shell, insulated, refrigerated and heated types, both rectangular and cylindrical. Accessories such as air agitators, mechanical agitators, peepholes and automatic level indicators are depicted. Also included are tables of typical tank dimensions.

Bul G-479 is available from Dept. AS-7, Cherry-Burrell Corp., Dept. CP, 427 W. Randolph St., Chicago 6, Ill. When inquiring specify CP 5498 on handy form, pages 2 and 3.

for the exacting answers
to your filtration problems . . .



**SPERRY
FILTER PRESSES**

When you consider the many advantages of Sperry Filter Presses, you can quickly understand why hundreds of manufacturers throughout the country depend on Sperry for solving industrial filtration problems of every kind.

Sperry Filter Presses offer greater economy — low first cost, minimum maintenance and long life . . . require less floor space . . . handle any kind of filterable mixture . . . and use practically any kind of filter material. For the complete story, ask for the big free Sperry catalog.

D. R. SPERRY & CO. BATAVIA, ILLINOIS

Filtration Engineers for More Than 60 Years

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Western Sales Representative: B. M. Pilshay, 833 Merchants Exchange San Francisco 4, California DO 2-0375

When inquiring check CP 5499 on handy form, pgs. 2-3



HIGHEST STANDARD OF QUALITY

Ethylene specializes in producing a wide variety of Teflon forms which are stocked in large quantities to assure quick shipment. Engineering experience is available to help solve your problems.

EXTRUDED OR MOLDED RODS, TUBES, AND SPECIAL SHAPES
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• PRECISION MACHINED COMPONENTS • FILLED PRODUCTS

Send for new illustrated Catalog 53 with stock and price lists.

Pioneers and Specialists in TEFLON products

ETHYLENE CHEMICAL CORPORATION

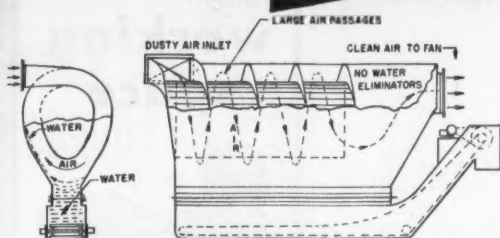
245 Broad St. • Summit, New Jersey

*Du Pont Trade-Mark for tetrafluoroethylene resin

When inquiring check CP 5500 on handy form, pgs. 2-3

CHEMICAL PROCESSING

Air Tumbler



The Master of **DUST** In Industry

CONSTANT CAPACITY and sustained HIGH EFFICIENCY with a minimum of maintenance are among the most important characteristics of the AIR TUMBLER. They result from its simplicity of design and operation, which dispenses with sprays, pumps, water eliminators, rotating elements, and similar devices.

The AIR TUMBLER in a short time has found its way into every kind of industry in this country and abroad, and has become standard equipment wherever tried.

For further information write to:

Dust Suppression and Engineering Co.

P. O. Box 67 Lake Orion, Michigan

Or to any of the following Licensees:

AUSTRALIA Air-Dust Separators Co. Klipp 15 O'Connell St., Sydney	CANADA Kelly Limited 68 Higgins Ave., Winnipeg	BRAZIL Gema S.A. Caixa Postal 4963, Sao Paulo
ITALY Aerotecnica Marzilli Casella Postale 1217, Milano C.	SWITZERLAND Machines Electriques S.A. 59 Rue du Rhone, Geneva	

When inquiring check CP 5501 on handy form, pgs. 2-3

FASTER HEAT TRANSFER for 50% of the COST

with
PLATECOILS

(REPLACES PIPE COILS)

A Platecoil has more heat transfer area than a pipe coil twice its size. Thus it takes only half as much Platecoil to heat a given area. You have 50% less steel to pay for so you can save nearly 50% in initial cost. The Platecoil takes only half as much space in the tank. The greater BTU transfer per unit area of Platecoil also means faster heating or cooling. Platecoils require less maintenance and can be removed without dumping the solution.

Send for complete
technical manual and
descriptive Bulletin No. P54

PLATECOIL
Division of
Tranter Mfg. Inc.
KANSAS CITY, MISSOURI

When inquiring check CP 5502 on handy form, pgs. 2-3

DECEMBER, 1953

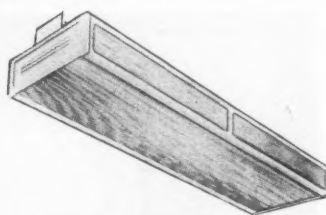
CONSTRUCTION

Unit is adaptable to
variety of lighting
problems

Uses: As a fluorescent, ceiling
light fixture.

Features: Simple lines of fixture
make possible great freedom in pat-
tern planning. Unit is said to form
any square or rectangle, T, U, L, H
... any design that is desired.

Description: Fixture provides
evenly distributed illumination with
20% uplight and 80% downlight.



Unit will combine with others to
form any design desired

Top plates for 100% downlight are
available. Luminous side panels
add a cheerful, eye-pleasing effect.

Made in sizes for every application,
unit is available with 2, 3, or 4
lamps — four or eight feet long.
Flexibility also permits use of a
wide range of louvers and diffusers.

(Peer-Lite is a product of The Ed-
win F. Guth Co., Dept. CP, 2615
Washington Blvd., St. Louis 3, Mo.
... or for more information check
CP 5503 on handy form, pages 2
and 3.)

PrevIEWS magnetic pulleys

Colorful 16-page bulletin lists
manufacturer's line of magnetic
pulleys and magnetic pulley sep-
arators in catalog form. Text
covers features of units, design
and construction, principle of
operation, and various fields of
application.

Selection factors and specifica-
tions are tabulated, while line
drawings and pictures illustrate
the units and their operations in
detail.

Bul 303B is issued by Stearns
Magnetic, Inc., Dept. CP, Mil-
waukee 46, Wis. When inquir-
ing specify CP 5504 on handy
form, pages 2 and 3.

POSITIVE Feed Action

- LARGE FREE-FLOWING HOPPER OPENING
- NO CLOGGING IN THE WORMS!

With Welding Engineers Equip-
ment You Can Obtain

**LARGER
OUTPUT
CAPACITIES
ON
RODS
SHAPES
PELLETS!**

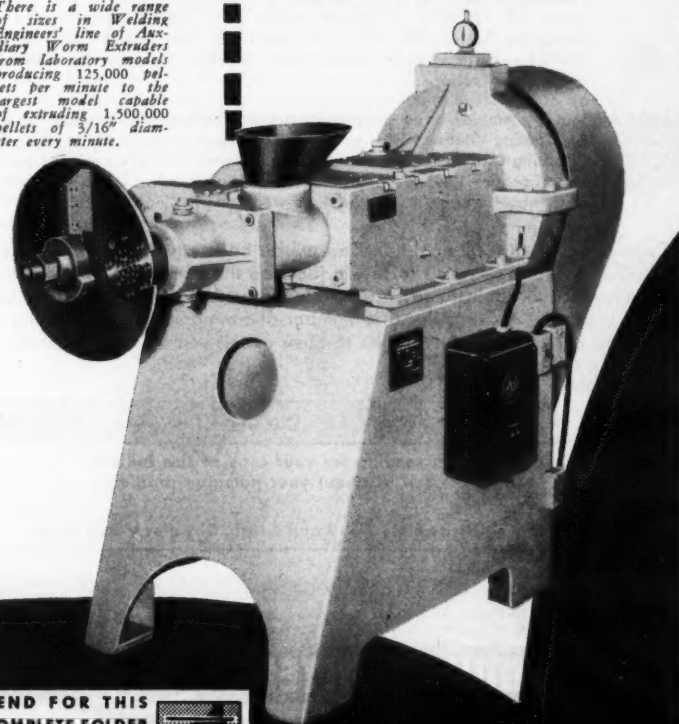
The improved feed action of the Welding
Engineers Auxiliary Worm Extruder is real-
ized in all sizes of machines ... from the
twin screw 2" model with a 3 1/2" diameter
hopper, used in laboratory work and small
scale production ... up to the large ma-
chines. The 6" model has a 10" x 12"
hopper which permits acceptance of material
which might otherwise be impossible to get
into the worms. These are compact, self-
contained units which process at high rate
output. If you are interested in:

CLAYS CATALYSTS FILTER CAKES
DRUGS DIATOMACEOUS EARTH METAL ORES
CAULKING COMPOUNDS RUBBER ACCELERATORS
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... Get the Welding Engineers' story!
For efficiency, low-cost production and im-
proved quality ... your best investment
is a

WELDING ENGINEERS

Auxiliary Worm Extruder

There is a wide range
of sizes in Welding
Engineers' line of Aux-
iliary Worm Extruders
from laboratory models
producing 125,000 pel-
lets per minute to the
largest model capable
of extruding 1,500,000
pellets of 3/16" diam-
eter every minute.



SEND FOR THIS
COMPLETE FOLDER

with descriptive data,
illustrations of models
and the complete story
of the Welding Engineers
Auxiliary Worm Extruder

WELDING ENGINEERS, INC.
NORRISTOWN, PENNSYLVANIA

When inquiring check CP 5505 on handy form, pgs. 2-3

OLIVITE Acid-Handling PUMP



Corrosion and leakage!
Two important questions
when considering chemical-
handling pumps.

Here's how the Olivite answers them:

CORROSION... the cast-iron casing, cover and impeller are protected by a heavy covering of OLIVITE, firmly bonded to the metal. It will not pull away or slough off. OLIVITE—a special rubber base plastic impervious to most chemicals, hot or cold, strong or weak. For special chemicals we have OLIVEX—a strong high tensile plastic of which the impeller is made for certain applications.

LEAKAGE... We employ three elements to prevent leakage and protect the shaft: 1) Floating Stuffing Box which constantly adjusts itself to the shaft; 2) Spring-Loaded Gland enabling the operator to easily keep the packing under proper pressure; 3) Removable Shaft sleeve which protects the shaft against corrosion as well as wear.

Even assuming that all acid-handling pumps have equal pumping efficiency—which they don't—your choice will focus on the pump that provides maximum protection against corrosion and leakage. At least, these two thoughts were important in the minds of a number of companies now operating 100 or more Olivites. Would you like to have us tell you more about these big Olivite installations?

Our OLIVITE Bulletin No. 308-R

In sending for your copy of this bulletin,
tell us about your pumping problem.

Olivite Sizes 1½, 2 and 4 inch; Direct or V-belt drive.

NEW YORK 36—33 West 42nd Street • CHICAGO 1—221 North LaSalle Street
OAKLAND 1—2900 Glasscock Street • SAN FRANCISCO 11—260 California Street

OLIVER UNITED FILTERS



WORLD WIDE SALES, SERVICE AND MANUFACTURING FACILITIES

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Johannesburg, Transvaal
SOUTH AMERICA & ASIA
The Dorr Co.
Stamford, Conn.

When inquiring check CP 5506 on handy form, pgs. 2-3

CONSTRUCTION & MAINTENANCE

**Necessity for racks eliminated
by reinforced plastic trays
which stack and lock**

Uses: For freezing, dehydrating, and other food, chemical, and pharmaceutical material handling operations.

Features: Tray eliminates necessity for racks, as sides are open, permitting passage of air. Stacking lugs on four sides permit a stack of trays to be held at a 45° angle without danger of toppling.

Description: Lightweight material (fiberglass reinforced plastic) from which trays are molded is said to be very durable and will not dent, warp, or rot.



Stacking lugs permit trays to be held at 45° angle
without toppling

It is also reported that this rigid, non-corrosive tray is dimensionally stable from minus 60°F to 300°F, and is unaffected by most chemicals and alkalis.

(Plastic trays are a product of Molded Fiberglass Tray Co., Dept. CP, Linesville, Pa. . . or for more information check CP 5507 between pages 2 and 3.)

**All but dirtiest electric motors
can be cleaned while running
in non-conducting solvent**

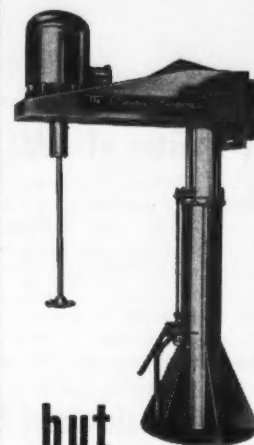
Uses: Dirty motors and generators are cleaned by full immersion, while running, in tank containing special liquid cleanser. Liquid may also be sprayed into intake side of motors but this practice is not as thorough as immersion method.

Features: Liquid is an absolute non-conductor and is approved by Underwriters Laboratories. Initial boiling point is 167°F and no flash or fire points are detectable prior to that temperature.

Rate of evaporation of generator-motor cleanser is comparatively low and fluid is not affected by discoloration. It will not affect wiring or insulation which is gasoline or oil resistant. Motors which have been accidentally submerged in water as a result of fires, floods, etc may be cleaned by this method without "baking".

Description: Generator-motor cleanser is placed in sufficiently large dip tank and in adequate

same
working
space



but
CAPACITY
DOUBLED

with a Cowles



Stymied by insufficient dissolving capacity? Then replace your present mixer with a Cowles Dissolver—it more than doubles your capacity in the same working space!

THE COWLES DISSOLVER is a high-speed unit. Its impeller operates at velocities up to 7,500 f.p.m. And that means dissolving and dispersing move 2 to 20 times faster—that you save time and labor while improving your product. It's rugged, fast-loading, easily maintained—performs tasks other mixers cannot because it's engineered to the job.

WRITE FOR CATALOG on Cowles Dissolvers! And ask to have a detailed test run on your materials—no obligation.

The Cowles Company
INCORPORATED
113 TRACKSIDE • CAYUGA, N.Y.

When inquiring specify CP 5508
on handy form, pgs. 2-3

CHEMICAL PROCESSING

Fitting
Problem?



ONLY
Koncentrik
flared-tube fittings
(in Stainless or Monel)
give you the
PATENTED 2-WAY SEAL



1. Double-sealing, self-centering seat is Teflon-reinforced to give you DOUBLE protection against costly, dangerous leaks.
2. Heavy-duty, fatigue-proof . . . designed for high pressure use.
3. Easy to install.
4. Economical . . . parts interchangeable and reusable.
5. Complete line for tubing through 1" O.D.
6. Prompt shipment through leading Stainless distributors.

Our engineers will be glad to work closely with you in solving your special tube fitting problems.

**THE SPECIAL SCREW
PRODUCTS CO.**

5445 Dunham Rd., Bedford, Ohio

Send for Proof

Literature covering
Koncentrik fittings, and
Powell valves with ma-
chined-in Koncentrik con-
nections, now available.
Write today.



When inquiring check CP 5509
on handy form, pgs. 2-3

CONSTRUCTION & MAINTENANCE

quantity to accommodate biggest motor to be cleaned. Tank should be equipped with a rack for motor to rest upon and a sump or pit into which foreign particles and sediment may settle.

Motor is completely submerged in solution, plugged into electric current, and allowed to run for 3-5 minutes. Current is broken, and motor is removed from tank and dried with compressed air. Extremely dirty motors may require more time.

Sealed motors may be cleaned with solution but, after cleaning, housing should be removed and all parts thoroughly dried with compressed air. Motors equipped with ball bearings should be completely relubricated, and those with oil well and ring lubrication should be drained before being immersed in solution and refilled after cleaning. Centrifugal starting mechanisms in motors may stick after cleaning and should also be relubricated.

Use of rubber or Neoprene gloves is highly desirable when working with solution for, as with other solvents, it removes oil in skin. Toxicity of liquid cleanser is comparable to that of carbon tetrachloride and inhalation of fumes should be avoided. Tanks in which cleanser is stored should be grounded merely as safety precaution.

(Generator-motor cleanser is supplied by The Shaler Co., Dept. CP, Waupun, Wis. . . . or for more information check CP 5510 on handy form, pgs. 2 & 3.)

Manual adjustment of nozzle on metallizing machine eliminated by design

Uses: For metallizing operations.

Features: Nozzle on metallizing machine eliminates need for manual adjustments by operator and assures an even flow of metal to surface being metallized, according to manufacturer. Gas mixing chamber is built in nozzle at point of combustion, completely eliminating backfire.

Description: Machine is lightweight, compact, and easy to operate. Designed to be trouble free, all bearings for wire feed mechanism are encased in main body gear case casting. Unit reportedly is easily repaired by semi-skilled workmen on the spot.

(Metallizing machine is a product of Vandersee Engineering Co., Inc., Dept. CP, 727 W. 7th St., Los Angeles, Calif. . . . or for more information check CP 5511 on handy form located between pages two and three.)



Machine is compact, light-
weight, and is said to be
easy to operate



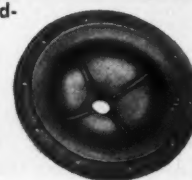
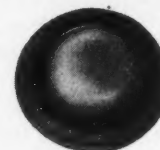
ODS Diaphragm SLURRY PUMP

Every Contact Inch
Highly Corrosion Resistant

ODS Pumps are available, of course, unlined for handling non-corroding slurries or solutions but when protection is necessary, all contact surfaces are lined with rubber or neoprene.

So, if you have a pumping problem that calls for a diaphragm pump—regardless of the pH involved—get all the facts about the O.D.S. It can handle just about any slurry or solution found in industry. And it has one of the best low-maintenance features to be found among all pumps: a no-linkage, hole and slot-free diaphragm. Compressed air or vacuum actuates the diaphragm.

Our Bulletin 309-R—recently issued—gives all the latest details about the O.D.S. Pump. In writing for a copy, tell us about your pumping problem. We have a line of acid-handling centrifugal pumps, too—the Olivites.



New York 36—33 W. 42nd St. Chicago 1—221 N. LaSalle St.
Oakland 1—2900 Glascock St. San Francisco 11—260 Calif. St.
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OLIVER UNITED FILTERS



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The Dorr Co.
Stamford, Conn.
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Hobart Duff Pty., Ltd.
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SOUTH AFRICA
E. L. Boteman Pty., Ltd.
Johannesburg, Transvaal

When inquiring check CP 5512 on handy form, pgs. 2-3



**WE *Specialize* IN YOUR PROBLEMS
OF MOVING GAS OR AIR!**

You may need to move a thimbleful of gas... or create a cyclone of whirling air. Whatever your problem, we've probably met something close to it, in experience of almost a century of building such equipment.

Another reason why we know so much about this job is that it's all we do. Our customers range from the "giants of industry" to the neighborhood plant, both of whose production depends upon continuous, reliable, economical performance of air and gas handling units. Because we build the exclusive *dual-ability* line of Rotary Positive and Centrifugal Units, in a wide range of sizes, we offer a *dual choice* which permits completely unbiased recommendations.

So—if you have a problem today—or anticipate one a year or five years from now, we suggest you call upon the facilities of R-C Specialists. Write for bulletins on any specific equipment.

ROOTS-CONNSVILLE BLOWER

A DIVISION OF DRESSER INDUSTRIES, INC. • 253 Richland Ave. • Connersville, Indiana

When inquiring check CP 5513 on handy form, pgs. 2-3

ROOTS-CONNSVILLE
*Exclusive Specialists
in Handling
Gas and Air*

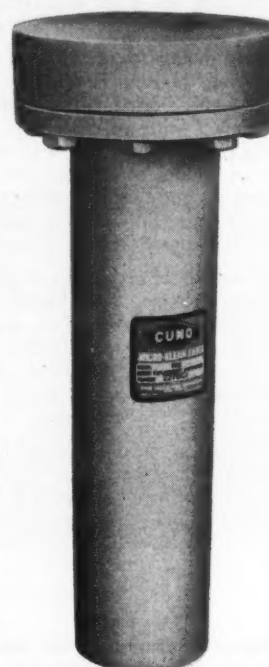
CONSTRUCTION & MAINTENANCE

Operating pressures to 1000 psi handled by all-welded steel liquid and gas filters

High pressure liquid and gas filters, produced in series IH and IHG respectively, have been added to manufacturer's Micro-Klean line. Standard units are available for operating pressures up to 1000 psi. Filters designed for even higher pressures are available.

Construction is all-welded steel with head piece machined from bar stock. Pipe sizes for inlet and outlet connections are $\frac{3}{8}$, $\frac{1}{2}$, and $\frac{3}{4}$ ". Guaranteed degrees of filtration through filter cartridges are 10, 25, 50, and 75 microns (.000394 to .0029"). Maximum capacity for liquid at 150 SSU, two lb pressure drop, and 50 micron degree of filtration is 15 gpm. For gases at 1000 psig, two lb pressure drop, and 25 micron degree of filtration, maximum capacity is 200 scfm (Free Air).

(High pressure filters are a product of Cuno Engineering Corp., Dept. CP, Meriden, Conn. . . or for more information check CP 5514 on handy form, pages 2 and 3.)



Pipe sizes for inlet and outlet connections are $\frac{3}{8}$, $\frac{1}{2}$, and $\frac{3}{4}$ "

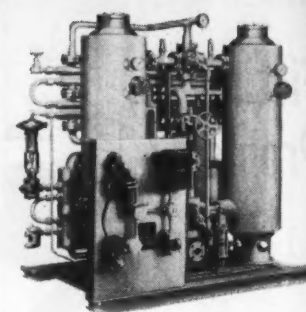
Pump construction provides maximum hydraulic hp in minimum floor space

Uses: For a wide variety of industrial applications, including pumping oil, brines, acids, alkalis, solvents, and wastes.

Features: Pump is of vertical, triplex construction which provides maximum hydraulic horsepower in minimum floor space. Unit is designed for continuous, 24 hr per day service.

Description: Pump operates in a speed range of 200 to 400 rpm and delivers from 12.5 gpm at 100 rpm and to 50 gpm at 400 rpm, with a maximum pressure of 2050 psi using a 1- $\frac{3}{4}$ " diameter plunger. Maximum size plunger, 2- $\frac{3}{4}$ " diameter, delivers 30.8 gpm at 100 rpm and 123.5 gpm at 400 rpm, with a maximum pressure of 825 psi.

Entire power end of pump is enclosed, affording weather protection and safety of operation. Fluid



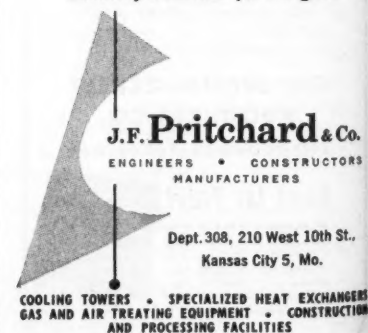
**This is a Pritchard
HYDRYER*—the choice
of critical buyers in the
petrochemical industry
for efficient, dependable
dehydration!**

This quality packaged unit promises long, trouble-free operation in drying compressed air and other gases for instrument and process controls. Adsorbents are carefully selected for your drying requirements. Completely factory assembled.

Custom units designed for any special need. To cut dehydration costs, contact Pritchard today.

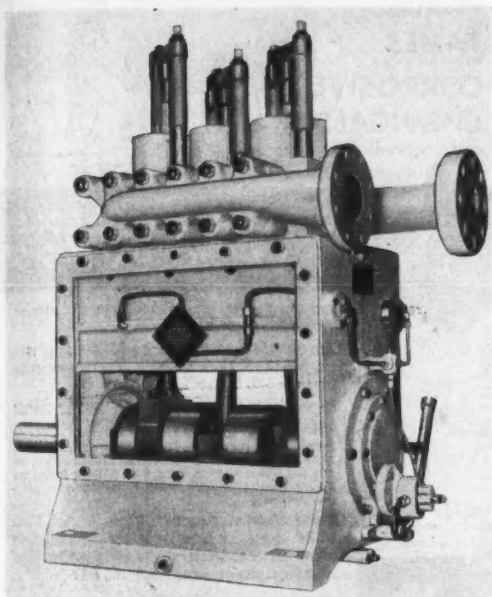
* Registered Trade Name

Industry's Partner for Progress



When inquiring check CP 5515
on handy form, pgs. 2-3

CHEMICAL PROCESSING



Unit is designed for continuous, 24 hr per day service

end is sectionalized, and separate from power end; straight line flow minimizes turbulence. Tapered, double-row, factory-adjusted roller main bearings are used for crankshaft. Pressure system lubricates cross-head guides, crosshead pin and crank pin bearings.

(TP-4000 Series Pump is a product of Ajax Iron Works, Dept. CP, Corry, Pa. . . . or for more information check CP 5516 on handy form located between pages 2 and three.)

Flame failure explosions eliminated by burner programming control

Uses: Programming control for commercial-industrial gas, oil, or combination gas/oil burners.

Features: Employing flame-sensitive cell, unit shuts off fuel in two to four seconds after burner flame goes out, eliminating explosion hazard.

Description: Fireeye control offers simplified specification, installation, and maintenance by providing a single standard package unit with complete automatic startup, operating, and shutdown control for any type burner plus a selection of programming times for three types of ignition operation. Its fail-safe circuit prevents operation under any unsafe condition. Plug-in chassis provides maximum accessibility and ease of installation. Control is built to withstand vibration and give continuous performance under the most adverse industrial conditions, according to manufacturer.

(Programming control is a product of Combustion Control Corp., Dept. CP, 718 Beacon St., Boston, Mass. . . . or for more information check CP 5517 on handy form, pages 2 and 3.)

FREE! Basic guide book to Norton R basic materials

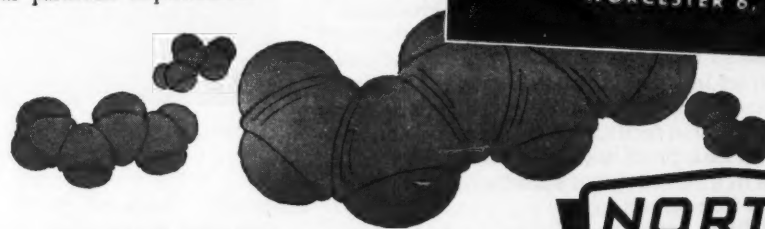
Filled with valuable facts on
electric furnace products
vital to industry

Here, in one compact booklet, is a complete list of Norton electrochemically refined basic materials for industry. Twenty-two pages of detailed descriptions of compositions and properties, with actual and suggested uses for the following:

ALUNDUM*, CRYSTOLON*, MAGNORITE* and NORBIDE* materials. Also FUSED STABILIZED ZIRCONIA, BORON NITRIDE, SPECIAL FUSED OXIDES, REFRACTORY CARBIDES, REFRACTORY BORIDES, MIXED BORIDES, ELEMENTAL BORON and EXPERIMENTAL BORIDES, CARBIDES, NITRIDES and SILICIDES.

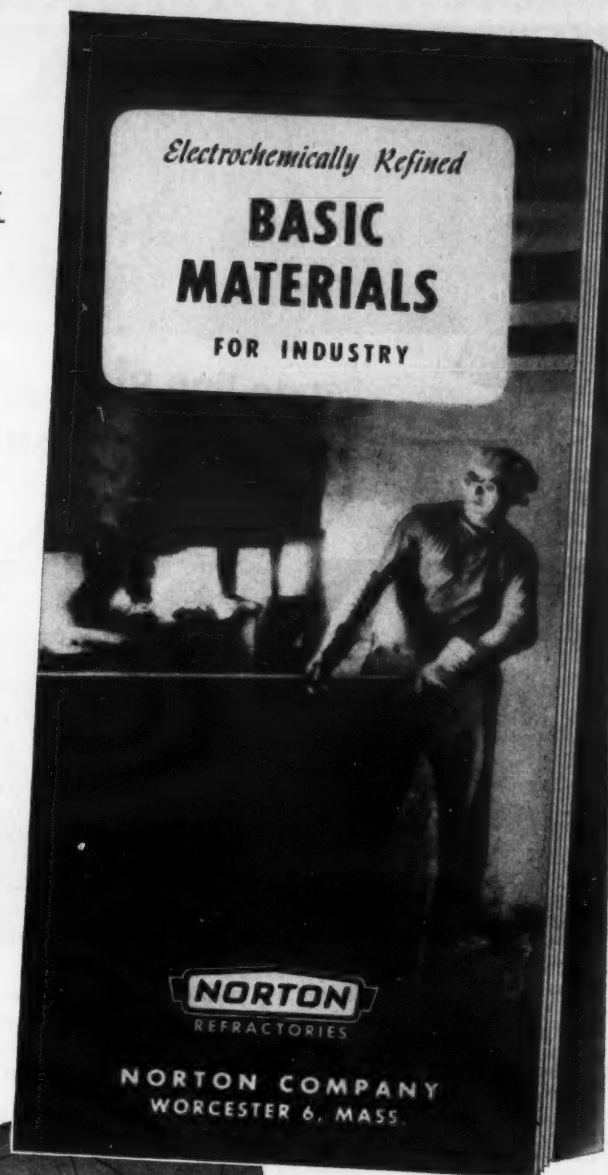
*Available in Many Standard
or Special Forms*

Besides supplying these materials in their crude forms, more or less as they come from the furnace, Norton has extensive facilities for processing and fabricating and is ready to work with you on engineering materials to your particular requirements.



For YOUR Applications

Many of these materials are in regular industrial use. New uses are being found for others, while the rest are still being tested and developed. That's why it will pay you to read about them very carefully. In this booklet you may find exactly the combinations of properties you are looking for. For your copy of "Basic Materials" write to NORTON COMPANY, 571 New Bond St., Worcester 6, Mass.



NORTON

R REFRACTORIES

*Making better products . . .
to make other products better*

*Trade-Marks Reg. U. S. Pat. Off. and Foreign Countries

When inquiring check CP 5518 on handy form, pgs. 2-3

NOW...

to handle
those
difficult
piping
problems

JOHN CRANE

Offers a complete line of
BELLOWS MADE OF TEFLON*



- ① **Chemically inert**
—will handle all corrosive liquids, petroleum products, gases and solvents.
- ② **Life-long flexibility**
—will not damage or fatigue under severe vibration or repeated expansion and contraction.
- ③ **Outstanding electrochemical properties**
—eliminate electrolysis in the handling of chemicals, acids, etc.
- ④ **Wide temperature range**
—flex perfectly and otherwise physically unaffected over a wide temperature range.

Further information on Teflon parts and products, including bellows connectors, pump and valve packings, tubing and other molded forms, is available in "John Crane's" 12-page illustrated catalog, The Best in Teflon. Send now for your free copy. Crane Packing Company, 1821 Cuyler Avenue, Chicago 13, Illinois.



JOHN CRANE

CRANE PACKING COMPANY

*DuPont Trademark for tetrafluoroethylene resin.

When inquiring check CP 5519 on handy form, pgs. 2-3

CONSTRUCTION

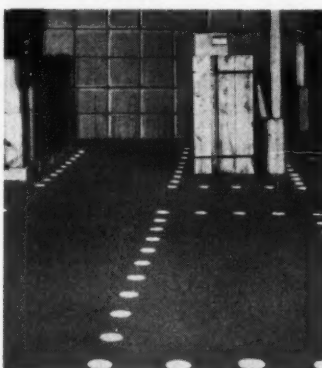
**Simplicity of installation,
economy with plastic
aisle markers . . .**

colorful dots command attention in poorly lighted areas

Uses: As aisle makers in plants, warehouses, shipping departments, parking areas, and the like. Dots may also be used in pillar and column making, bay marking, machine and equipment identification, and stairway marking.

Features: Beside costing less than paint, molded markers, or tape, aisle markers are economical to apply. They stick fast to any clean, dry floor without moistening. Curved or straight lines can be made quickly without costly machinery. No clean-up is necessary and production isn't disrupted while paint dries. Markers give high visibility, even in poorly lighted areas.

Description: Aisle markers are made of durable, colorful plastic, backed with a heavy-duty, pressure-sensitive adhesive. They are only .005" thick, but highly resistant to



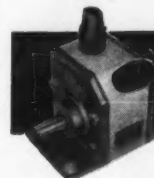
Reported to outlast painted lines five to one

abrasion. Acids, oil, grease, salts, water, and most common solvents have no effect on markers.

Each marker is mounted on a 2-piece folded paper liner which protects adhesive until used. Stock circular markers are available in 2, 3, 4, and 5" diameters; colors are caution yellow, fire red, safety green, and neutral white. Directional arrows are available in 2, 3, 4, and 5" sizes. Special sizes, colors, and shapes can be made.

(Aisle makers are a product of W. H. Brady Co., Dept. CP, 727

**VANTON
PUMP
TAMES
CORROSIVE
CHEMICALS**



**POLYETHYLENE
flex-i-liner PUMPS**

are designed to handle the toughest corrosive chemicals and abrasive slurries.

The durable precision molded flexible liner and the pump body block are the only parts contacting the fluid.

No stuffing boxes, shaft seals, check valves, glands or gaskets to worry about.

Body blocks in: Polyethylene, Bakelite, Buna M Hard Rubber, unplasticized PVC, Stainless Steel. Flexible liners in: Natural and pure gum rubber, Neoprene, Hycar, Buna M, Vinyl, Compur and Silicone. The wide choice of materials means trouble free, corrosion free service.

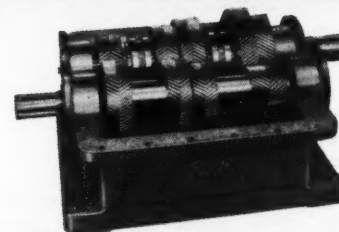
Pump capacities from fractional to 20 gpm. Illustrated booklet on request, as well as descriptive literature on complete line of corrosion resistant centrifugal pumps, valves, pipe and fittings.



VANTON
PUMP & EQUIPMENT CORP.
EMPIRE STATE BLDG. NEW YORK 1, N. Y.

When inquiring check CP 5520 on handy form, pgs. 2-3

**Philadelphia
CHANGE-SPEED UNIT**



**Standardized Construction
—to give you Greatest Economy**

Based on long experience in building Change-Speed Units to individual specifications, Philadelphia has developed a line of standardized units. This cuts the high cost and delayed deliveries of former methods.

Units are positive geared drives using herringbone gears throughout. No belts to wear or slip. Ratios are definite for speed increasing or reduction or in combination. Wide range of horsepower in 2, 3 and 4 speed units.

Write for bulletin giving full details.

PHILADELPHIA GEAR WORKS, Inc.
ERIE AVENUE AND G STREET • PHILADELPHIA 34, PA.
NEW YORK • PITTSBURGH • CHICAGO • HOUSTON • LYNCHBURG VA

When inquiring check CP 5521 on handy form, pgs. 2-3

CHEMICAL PROCESSING

If you have a labeling problem ordinary labels can't solve...use

AVERY Kum-Kleen self-adhesive LABELS



...the tough ones are our specialty
...where other types of labels are found "wanting" ...or when you need to substitute an attractive pressure-sensitive label for a costly nameplate... Avery Kum-Kleen labels are the best solution to your problem!

...and so are the other kind...

...where you want faster labeling... improved appearance... labels that won't pop, curl or peel... or those the housewife can remove without soaking or scraping... there's no substitute for an Avery Kum-Kleen label!



faster • easier • more economical

Patented Avery dispensers... manual or electric... feed die-cut pressure-sensitive labels off roller tape, ready to be LAID ON any clean, smooth surface. No moistening... no sticky fingers. Where can YOU use these labels in YOUR business? Write today for free samples, case histories and prices.

EVERY ADHESIVE LABEL CORP., DIV. 123
117 Liberty Street, New York 6 • 608 South Dearborn Street, Chicago 5
1616 So. California Ave., Monrovia, Cal. • Offices in Other Principal Cities
Originators of Pressure-Sensitive Labels

When inquiring check CP 5522 on handy form, pgs. 2-3

Famous Holes

H & K Perforated Holes

Years and years ago, Santa made the chimney hole famous — tho for only one night each year. For more than 70 years H & K Perforated Holes have spread their benefits thru every day of the year for savings and greater efficiency in industrial processing requiring cleaning, sizing, filtering and straining — for ventilating, guarding and decorating — for the escape of sound, light and air and thousands of other uses.

We have, thru these many years, built tools with which to perforate practically any pattern you may require — in any of the metals, plastics, plywood or other materials available in coil, sheet or plate form.

From stock, we offer you many patterns of round holes and slots in steel, tinplate and brass — and ornamental patterns in steel.

Remember —
"If it can be perforated H & K can perforate it!"

Harrington & King
PERFORATING CO.

5636 Fillmore Street, Chicago 44, Ill.
114 Liberty Street, New York 6, N. Y.

Ask for catalog No. 62 for complete information

When inquiring check CP 5523 on handy form, pgs. 2-3

CONSTRUCTION

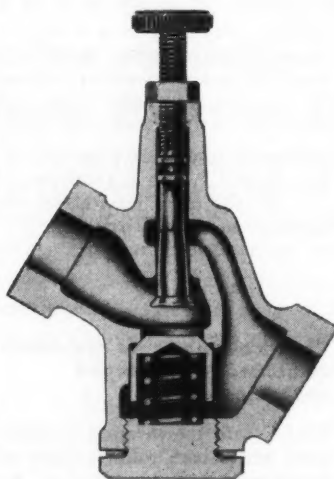
W. Glendale Ave., Milwaukee 12, Wis. . . . or for more information check CP 5524 on handy form, pages 2 and 3.)

Split-second timing is highlight of air control valve

Uses: Wherever it is necessary to control the flow of air.

Features: Valve has complete ease of adjustment, accomplished by the many turns provided on adjusting stem. Orifice controlling air flow can be quickly adjusted from practically zero to wide open. Valve provides split-second timing of piston movement by positive control of air flow.

Description: Unit can be mounted in any position between the operating valve and one or both ends of a cylinder to provide



Ease of adjustment is accomplished by the many turns provided on adjusting stem

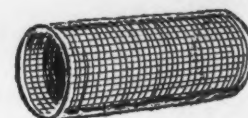
air flow adjustment. Construction of valve is simple and rugged. Poppet is only moving part. Valve is designed for ease of maintenance and can be disassembled without breaking line connection. It is available 1/4, 3/8, 1/2, 3/4, 1, and 1 1/4" IPT.

(Product of Ross Operating Valve Co., Dept. CP, 120 East Golden Gate, Detroit 3, Mich. . . . or for more information check CP 5525 on handy form, between pages two and three.)

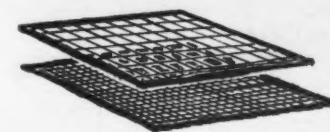
filter leaves?



strainers?



sizing screens?



Cambridge can build almost any type of wire cloth part to your specifications. Most likely the type of special wire cloth assembly you use has been built here in our plant. Our factory men can work from your specifications, or our Engineering Department can draw up working prints and specs based on merely your description of what the part must do. Why not let us quote the next time you need special wire cloth forms?

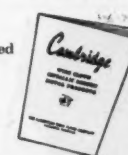
ALSO WIRE CLOTH IN BULK



...from warehouse or woven to order. We can also supply you with wire cloth in bulk for your own fabrication. Many common types are ready for immediate shipment from stock. And if your order needs special production, we'll schedule our looms to have the material in

your plant without delay. We can weave wire cloth in any metal or alloy and in sizes from 20x250 mesh up to 4" openings.

WRITE FOR CATALOG
For complete information write direct for this illustrated catalog. Or call in your Cambridge Field Engineer for a conference in your plant. He's listed under "Wire Cloth" in your classified phone book.



The Cambridge Wire Cloth Co.

WIRE CLOTH

METAL CONVEYOR BELTS

SPECIAL METAL FABRICATIONS

Department F
Cambridge 12,
Maryland

OFFICES IN PRINCIPAL INDUSTRIAL CITIES

When inquiring check CP 5526 on handy form, pgs. 2-3

Hanna Fluid Power Cylinders

... SMOOTH, DEPENDABLE **POWER**
FOR 1001 APPLICATIONS



Model 4 M



Model 10 M



Model 14 M



Model 16 M



Model 17 M



Model 18 M



Model HP 4



Model HP 10



Model HP 14



Model HP 16 A



Model HP 17



Model HP 18

Pneumatic and Hydraulic

There are standard model Hanna Cylinders for many ideal applications in your plant and in the machines and equipment you design and build. You'll find that they simplify and improve practically all types of machine control and actuation by eliminating a vast assortment of miscellaneous cams, cranks, screws, levers, etc. Hanna Cylinders operate efficiently and economically to provide the push, pull or lift movements required for the operation.

... High and Low Pressure

Hanna Cylinders are available in a selection of sizes, types and mounting styles to meet your exacting requirements. They are designed for operation by air, oil or water and for pressures up to 1500 psi.

There are thousands of Hanna Cylinders now at work throughout industry providing smooth, economical, dependable power for hundreds of applications. It will pay you to find out how Hanna Cylinders can help improve production and machine operation in your plant.

FREE! "27 Ways to Use Cylinder Power"

Send for the New "Cylinder Power in Action" Bulletin!

Bulletin 255 shows you 27 ways you can put cylinder power to work for you. Simple diagrams show 15 different cylinder movements that can make cylinders push, pull, lift, press, clamp or control. 21 actual application photographs show how Hanna Hydraulic and Pneumatic Cylinders are being used throughout industry to simplify and speed up power motion problems. Write for your copy today—there is no obligation.

Hanna Engineering Works

HYDRAULIC AND PNEUMATIC EQUIPMENT ... CYLINDERS ... VALVES ... RIVETERS

1744 ELSTON AVENUE, CHICAGO 22, ILLINOIS

When inquiring check CP 5527 on handy form, pgs. 2-3

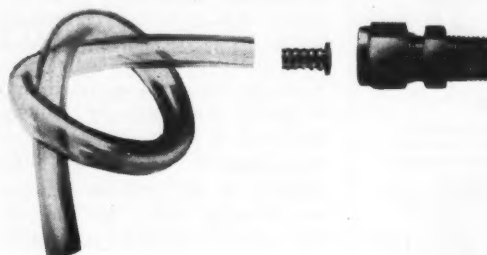
CONSTRUCTION & MAINTENANCE

Joins plastic tubing and fittings, supports ID of former, protects latter against cold flow

Uses: Particularly desirable for laboratory use when used in conjunction with manufacturer's leak-proof fittings and flexible Tygon tubing. Among other applications are piping water, gasoline, and certain oils and solutions.

Features: Inserts, available in any metal, protect tube fittings against cold flow of plastic and support inside dimension of plastic tubing. More rigid plastic tubings do not require use of inserts.

Description: Accompanying photo shows a "semi-exploded" view of three elements with insert in



middle. Assembly is a matter of seconds. Place insert in end of tube, slip finger-tight tube fitting over tube end, and, with an ordinary wrench, tighten nut one and one-quarter turns. Inserts for tube fittings can be furnished in a variety of sizes.

(Swagelok inserts are a product of Crawford Fitting Co., Dept. CP, 884 E. 140th St., Cleveland 10, Ohio ... or for more information check CP 5528 on handy form, pages 2 and 3.)

Chemical and temp resistance combined in enveloped rubber gasketing

Uses: In the chemical industry in those applications where both resilience and corrosion resistance are essential. Gaskets are used for hood, duct, and oven enclosures where corrosive conditions are encountered; and for door seals and joints where both cushioning and sealing are required.

Features: Gasket combines the excellent high and low temperature properties of silicone rubber with the chemical inertness of Teflon and Kel-F. Resilient core of silicone rubber or silicone rubber sponge is completely protected from chemical attack by the resistant envelope of Teflon or Kel-F. Gaskets thus have the compressibility and rubber-like properties of silicones plus chemical stability of fluorocarbons.

Description: Silicone core is available in solid stocks of various durometers and in silicone sponge. Fluorocarbon envelopes range in thickness from 0.0025 to 0.030", depending on use requirements.

Strip-type gaskets in various shapes and sizes, in lengths up to 96" and widths of 4", are available

basic PUMP SELECTION GUIDE

Learn BASIC FACTS before deciding on TYPE of PUMP

Fig. 19,488

Nickel, Nickel Alloys and all other Castable-Machineable Metals and Alloys are used to build Taber Pumps.



Big illustrations and brief descriptions with capacities and adaptability of types of pumps are contained in this unbiased compilation of facts to help avoid costly misapplication.

WRITE for BULLETIN S-146 on your company stationery, please.

TABER PUMP CO. (Est. 1859)
294 ELM ST. • BUFFALO 3, N. Y.

Fig. 6041



TABER

When inquiring check CP 5529 on handy form, pgs. 2-3

CHEMICAL PROCESSING

with envelopes of either fluorocarbon. In ring form for flange gaskets, Kel-F envelopes are generally used because a completely impervious covering can be formed which will withstand immersion in highly corrosive substances.

(Fluorlastic gaskets are a product of The Connecticut Hard Rubber Co., Dept. CP, 407 East St., New Haven 9, Conn. . . or for more information check CP 5530 on handy form, pages 2 and 3.)

Air loaded expanding core shaft reduces time necessary to shaft up rolls of stock

Uses: In the paper or printing industries, or wherever rolled stock is used.

Features: Patented unit is designed to reduce time necessary to shaft up rolls of stock. Air loaded principle is said to eliminate such devices as tapered core plugs, wedges, and screw arrangements.

Description: Aero-Shaft consists of a 2" OD, 1" ID steel tube. Drawn over steel tube is a Neoprene rubber tube held at each end by hose clamps. A set of eight spring steel ribs held in place by steel



Available for use with web widths from 10 to 80"

end collars having dove-tail slots, completes unit. Air enters automotive-type air valve mounted in end of unit. Valve is protected by heavy steel, counter-bored end plug.

Factory tests are said to have shown that unit has positive grip, long life, and will not damage cores. Shafts are available for use with 3" ID standard cores, in web widths from 10 to 80". For widths up to 40", a single set of spring steel ribs is used, and over 40" a double set with a center collar is used. Special shaft ends such as key ways, square ends, and brake driving pins are available.

(Expanding core shaft is a product of Paper Converting Machine Co., Dept. CP, Green Bay, Wis. . . or for more information check CP 5531 on handy form, pages 2 and 3.)

Discussion and description of steel shot abrasives

Blast cleaning and peening abrasive is covered in 8-page bulletin, which includes description of manufacturing process and discussion of abrasives and their operating qualities.

Bul 89 is issued by American Wheelabrator & Equipment Corp., Dept. CP, 1036 S. Byrkit St., Mishawaka, Ind. When inquiring specify CP 5532 on handy form, pages 2 and 3.



Large photo: 20" x 18" Double Roll Crusher handling Phosphate Rock.

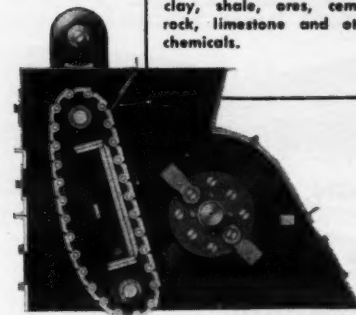
Cross-section: Jeffrey Mud Hog Crusher with traveling breaker plate for handling wet, sticky material such as clay, shale, ores, cement rock, limestone and other chemicals.

JEFFREY crushers and pulverizers solve reduction problems from Alum to Zinc

Jeffrey's Pulverizers and Crushers are the ideal solution to material reduction problems. Hundreds of these standard units are giving efficient, economical service to leaders in your industry. Each is backed by Jeffrey's unequalled experience in this field. Each includes many features only Jeffrey provides.

Whether your material is large or small, wet or dry, Jeffrey has the right machine to crush it . . . ranging from heavy-duty Type B Pulverizers for reducing quarry-size limestone . . . to Junior Pulverizers for laboratory work.

Our laboratories will make a crushing or pulverizing test on your material without charge and recommend the exact type Jeffrey equipment for your requirements.



TYPICAL JEFFREY REDUCTION UNITS

FLEXTOTH® Crushers
Single Roll Crushers
Double Roll Crushers
Rigid Hammer Shredders
Impact Type Crushers

Heavy Duty Rock Crushers
Swing Hammer Shredders
Swing Hammer Pulverizers
Metal Turnings Crushers
Mud Hog Crushers

Write for descriptive literature.



THE JEFFREY MANUFACTURING CO.
ESTABLISHED 1877
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**IF IT'S MINED, PROCESSED OR MOVED
...IT'S A JOB FOR JEFFREY!**

**sales offices and distributors
in principal cities**

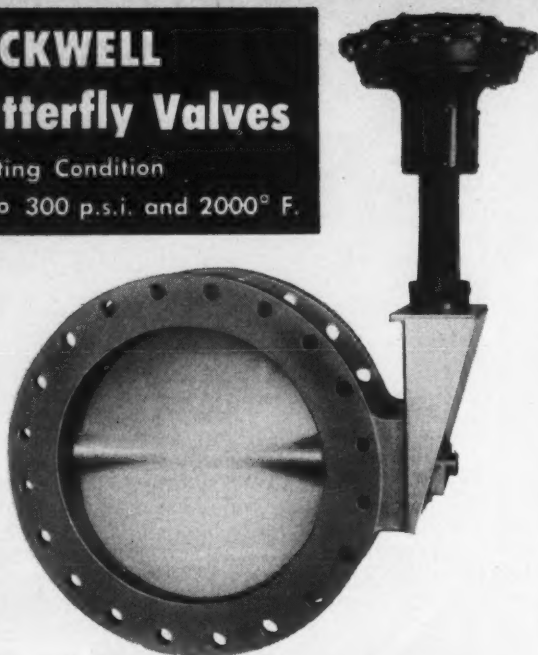
PLANTS IN CANADA, ENGLAND, SOUTH AFRICA

When inquiring check CP 5533 on handy form, pgs. 2-3

W. S. ROCKWELL Butterfly Valves

for Any Operating Condition
to 300 p.s.i. and 2000° F.

Minimum
Pressure Drop
•
Automatic or
Manual Control
•
of any metal
or rubber-lined
in sizes to 120"



W. S. ROCKWELL COMPANY

BUTTERFLY VALVES • SLIDE VALVES • AUTOMATIC VALVES

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Sales Representatives in Principal Cities

When inquiring check CP 5534 on handy form, pgs. 2-3

DESIGN ASSISTANCE

- DEPENDABILITY
- ENGINEERING SKILL
- EXPERIENCE

ECONOMY

from M & L to You...

The finest Heat Exchange Equipment that top flight materials and Engineering Ingenuity can produce.

You specify the conditions—Our engineers will establish the size, type, material and pressure specifications.

Send for bulletin 810 showing how M & L can help you solve your process equipment problems.

Manning & Lewis Engineering Co.

30 Ogden Street Newark 4, New Jersey
SALES REPRESENTATIVES IN PRINCIPAL CITIES

When inquiring check CP 5535 on handy form, pgs. 2-3

CONSTRUCTION & MAINTENANCE

Gas-oil burner efficiency upped by pump, valve, and filter units

Three units intended primarily for use on manufacturer's closed flame gas-oil burner have been added to his line of equipment. First unit is an edge-type plate filter said to separate all solids from fuel oils easily and quickly without stopping oil flow. Filtration is accomplished by passing oil between discs of metal, precisely separated by spacers of right thickness for particular oil to be used. Solids larger than spaces cling to the edge of discs, and only clean oil passes through. Solids accumulating on cartridge are easily removed by cleaner blades designed to do a complete job and settle solids in sump. Pipe sizes from 3/8 to 1" IPS are available.

Second unit is a direct-drive, roller-type pump for handling liquids with lubricating qualities. Pump is said to be able to operate at higher speeds, with same liquids, than more tightly fitted mechanisms. Units are rated for pressures up to 100 psi. Speeds of 1800 rpm may be used with liquids having viscosity characteristics equivalent to 40 SAE lubricating oil at 70°F. Liquids of greater viscosity, including pre-heated Bunker C fuel oil, may be handled at 1200 rpm. Volumetric efficiency varies with viscosity of liquid.

Oil pressure reducing and regulating valve is third unit to be introduced. Valve is a single seated, spring loaded, direct acting diaphragm type. It automatically reduces high pressure to low pressure and maintains low pressure regardless of fluctuations on high pressure side. Unit has a built-in strainer to safeguard moving parts and is so constructed that any restriction forces valve wide open with a self-cleaning effect on seat. Valve has a large bottom plug that allows easy inspection and cleaning of parts. It is available in standard pipe sizes ranging from 1/4 to 2" inclusive.

(Filter, pump, and valve are products of Eclipse Fuel Engineering Co., Dept. CP, Rockford, Ill. . . . or for more information check CP 5536 on handy form, pages 2 and 3.)

Oil, gas, or combination operates boiler-burner unit supplied as completely packaged plant

Uses: For high or low pressure heating, power and process steam.

Features: Unit operates on oil, gas, or oil and gas combination—with switching of fuels said to be accomplished in seconds. Plant is shipped completely assembled on steel skid, and is ready for operation as soon as fuel, water, steam, and electrical connections are made.

Description: Of ASME Code construction throughout, boiler is designed with large furnace volume to assure lower heat release, with proportional longer service life. Tubes are arranged in staggered rows so that release of steam from tube walls is speeded by a wiping action which is said to increase efficiency of heat transfer. Other boiler features include ample

PRECISION CUTTING

WILL IMPROVE

YOUR MOLDING

Use Taylor-Stiles plastics
and rubber CUTTERS



Made in various types and sizes with one characteristic in common—precision. For example:

Our dicing cutter cuts and cross cuts sheet stock into pellets of uniform dimensions in a single operation with a minimum of fines, first disc cutting the stock, then cross cutting it in a single continuous, one machine operation.

Another type machine cuts extruded stock into uniform sections suitable for molding into such products as rubber or composition soles or heels.

There's a Taylor-Stiles Cutter to perform any stock cutting operation required in rubber or plastics manufacture, adjustable for length of cuttings in all but one dimension in the pelletizer which first disc cuts then criss cuts the stock.

Let us know your rubber or plastics cutting problem. We can give you facts helpful in solving it.



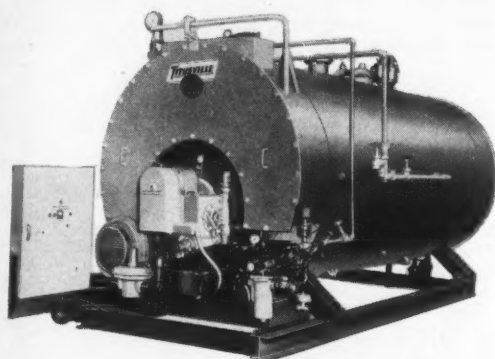
20 Bridge St., Riegelsville, New Jersey

When inquiring check CP 5537 on handy form, pgs. 2-3

CHEMICAL PROCESSING

steam disengaging surface to insure dry steam, ample openings for easy access and cleanability, davit flue-door suspension for easy one-man operation, and removable gas-tight rear cover plate.

Fully automatically-controlled burner unit has a turn-down of 5 to 1, and will operate at over 80% efficiency through its entire modulating range, burning either gas or oil, according to manufacturer. Fully



Ready for operation after fuel, water, steam, and electrical connections are made

automatic control center is alert to any possible change in boiler load or abnormal operating conditions. A volumetric oil control meters by volume the exact quantity of oil needed for varying loads, and an automatic oil heating system keeps heavy oil at correct temperature and viscosity for efficient combustion.

Entire boiler-burner unit is sealed for operation at higher-than-atmospheric pressure, thereby preventing air infiltration. No induced draft fan or natural draft stack are required.

Unit is supplied in two basic types — power units and heating boilers. Power units are built in a complete capacity range from 37 to 363 hp, at normal SBI rating, with certified output ratings from 56 to 545 hp. Heating boilers are built in sizes from 4250 to 42,500# EDR at normal SBI steam ratings with certified output from 6375 to 63,750# EDR.

(Boiler-burner unit is development of Iron Fireman Mfg. Co., Dept. CP, 3170 W. 106th St., Cleveland 11, Ohio, and Titusville Iron Works Co., Div. of Struthers Wells Corp., Dept. CP, Titusville, Pa. . . or for more information check CP 5538 on handy form, pages 2 and 3.)

Revised refrigeration manual

Latest edition of refrigeration manual contains two entirely new chapters on refrigeration piping. Material embodies latest engineering data on the subject. Other changes include a new chapter on refrigeration system control, a revised chapter on service operation, and a revised refrigeration system service analysis chart.

Refrigeration Manual may be obtained by remitting \$1.50 direct to The Trane Co., Dept. CP, La Crosse, Wis.

GUARANTEED

is a strong word

but **PROCTOR & SCHWARTZ**
can afford to use it...

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PROCTOR DRYING EQUIPMENT is backed
by a thorough analysis of the problem...
Proctor engineers' comprehensive
knowledge of sound dryer design and their
reputation for installing systems that
perform to guaranteed specifications.

Name a product that is being dried commercially and there is a 99% chance it is being done in a Proctor system. The background on which Proctor engineers draw when working on a drying problem covers a longer period of time (70 years)... and a wider range of products than can be found anywhere else in the world.

Only an organization with the breadth and depth of dryer design experience

possessed by Proctor engineers can make such a strong claim and make it stick. And there is no organization with this experience other than Proctor & Schwartz.

When you have a drying problem—the easiest and safest approach is to call Proctor engineers early. The sooner you have them working with you—the sooner you'll have your solution and your guarantee that it is the right solution.

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PHILADELPHIA 20, PA.

*The World's First Name In Industrial
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TRAY DRYERS • TRUCK DRYERS • CONTINUOUS CONVEYOR SYSTEMS
PRE-FORMING FEEDS • INFRA-RED FREEZE DRYING SYSTEMS • SPRAY DRYING •

When inquiring check CP 5539 on handy form, pgs. 2-3

for trouble-free service

GRINNELL

STAINLESS STEEL WELDING FITTINGS and FLANGES

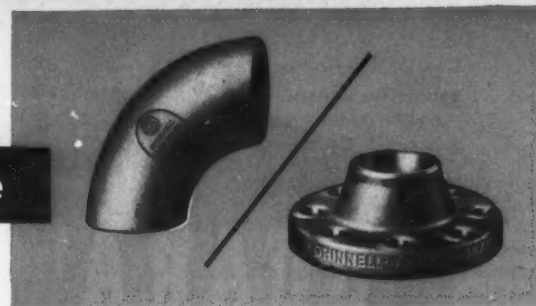
To help combat mounting costs in the installation and maintenance of piping systems where corrosive or certain other service conditions are involved, Grinnell offers a comprehensive range of welding fittings and flanges in stainless steel.

- To prevent corrosive attack.
- To obtain adequate impact resistance at low temperatures and sufficient creep strength at high temperatures.
- To provide sanitary conditions.
- To avoid contaminating the product.

Grinnell welding fittings and flanges are available in types 304, 347 and 316. These are in the chromium-nickel grades known as "18-8". The corrosion resistant properties of stainless steels are primarily due to the chromium content which ranges from 17% to 20%. The addition of nickel in ranges from 7% to 14% improves the corrosion resistance as well as the properties at elevated temperatures. A molybdenum addition of 2% to 3%, as found in type 316, increases the resistance to sulphurous and phosphoric acids, brine and hypochlorite solutions, and improves the general resistance to other corrosive liquids, as well as improving the physical properties at elevated temperatures. A columbium addition of approximately 0.4% to 1.0%, as found in type 347, creates non-susceptibility to carbide precipitation which can cause intergranular corrosion.

In addition to stainless steel, Grinnell offers welding fittings and flanges in carbon steel, nickel, Inconel, Monel, aluminum and brass.

Write for new booklet giving complete data on Grinnell stainless steel welding fittings and flanges. No obligation.



stainless steel welding fittings Types 304, 347, 316

DESCRIPTION	SCHEDULE†	PIPE SIZE, IN.‡
90° Long Radius Elbow	5s, 10s, 40s, 80s	½ to 12
45° Long Radius Elbow		
180° Long Radius Return		
Straight Tee		
Reducing Tee	5s, 10s, 40s, 80s	¾ to 12
Cross		
(Straight and Reducing)	5s, 10s, 40s, 80s	1¼ to 12
Concentric Reducer	5s, 10s, 40s, 80s	¾ to 12
Eccentric Reducer		
Lateral	5s, 10s, 40s, 80s	1 to 12
(Straight or Reducing)		
Cap	5s, 10s, 40s, 80s	½ to 12
Lap Joint Stub End-Long	10s, 40s, 80s	½ to 12
Lap Joint Stub End-Short	5s, 10s, 40s,	½ to 12

† 5s is Featherweight, 10s Lightweight, 40s Standard, 80s Extra Strong.
‡ Larger sizes available on special order.

stainless steel flanges

150 lb. and 300 lb. Steel Flange Standard (Higher series available on application).

DESCRIPTION	PIPE SIZE, IN.
Welding Neck	½ to 24
Slip-on	
Lap Joint	
Threaded	
Socket Type	½ to 12
Blind	

150 lb. Corrosion Resistant Standard. (For use with schedule 10s and 5s pipe. Rated at 150 psi at 500°F, 225 psi at 150°F, when used with full-faced gaskets).

DESCRIPTION	PIPE SIZE, IN.
Buttwelding	½ to 12
Slip-on	
Blind	½ to 12

GRINNELL

WHENEVER PIPING IS INVOLVED

Grinnell Company, Inc., Providence, Rhode Island

Coast-to-Coast Network of Branch Warehouses and Distributors

pipe and tube fittings • welding fittings • engineered pipe hangers and supports • Thermolier unit heaters • valves
Grinnell-Saunders diaphragm valves • pipe • prefabricated piping • plumbing and heating specialties • water works supplies
industrial supplies • Grinnell automatic sprinkler fire protection systems • Amco air conditioning systems

When inquiring check CP 5540 on handy form, pgs. 2-3

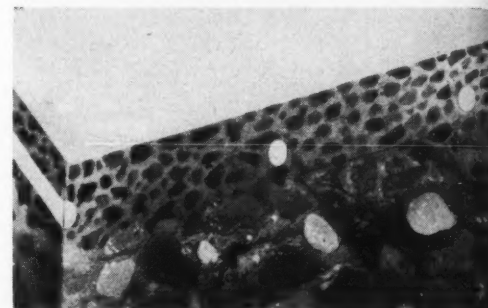
CONSTRUCTION & MAINTENANCE

Thermal shock, temps to 2000°F withstood by flooring

Uses: Suited for metal rolling mills, foundries, glass factories, or in any location where extreme heat can cause damage to floors.

Features: Designed to be used where temps range up to 2000°F, this industrial flooring disperses heat rapidly through aluminum rods imbedded about one inch below surface. Because of their high thermal conductivity, these rods carry heat from contact area and spread it over a wide section of floor.

Description: Flooring material consists of selected and graded rocks and sand combined with cements in a low-water ratio. High resistance to heat and



Cutaway shows power compacted flooring with embedded aluminum rods

deterioration from heavy traffic is said to be due to installation methods which include compacting with heavy power-driven equipment. Floor is ready for use in 24 hr.

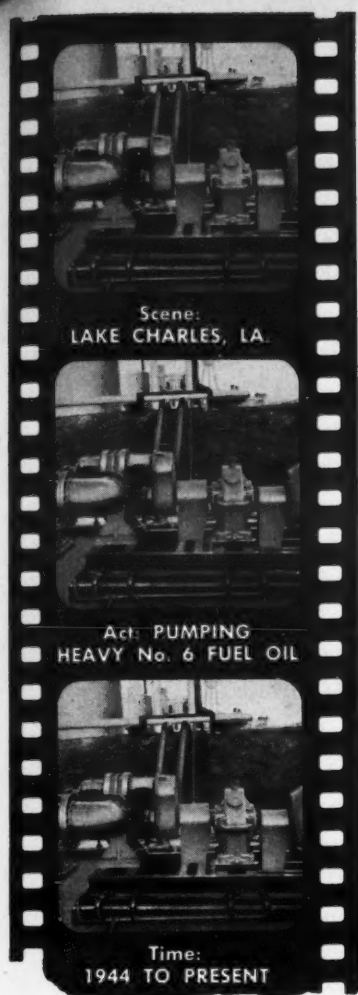
(Heat-resistant Dynapakt flooring is a product of Flash-Stone Co., Inc., Dept. CP, 30 E. Rittenhouse St., Philadelphia 44, Pa. . . or for more information check CP 5541 on handy form, pages 2 and 3.)

Simultaneously cuts and seals synthetic filter fabrics

Heat-sealed, ravel-proof holes and edges on synthetic filter fabrics are possible with recently introduced process. Fabrics are cut with specially designed, electrically heated blades. Cutters melt through synthetic fibers and fuse loose ends firmly together so they cannot separate and unravel. Result is a tightly bonded edge, said to be as dependable as selvage edges or buttonhole stitching.

Equipment permits sealing raw edges of holes and odd shapes that formerly could not be hemmed or stitched economically. Company is in production of yard goods heat-cut to any width, and is using process in custom fabrication of bags, tubes, and filtering units for all types of rotary and pressure filters, centrifuges, and dust collectors.

(Filter fabric heat-cutting process is a development of Filtration Fabrics Div., Filtration Engineers, Inc., Dept. CP, 155 Oraton St., Newark 4, N. J.)



This pump—a Kinney Heliquad Model HQA 147-31A—has already seen nearly a decade of service at the Lake Charles, La. plant of Cities Service Refining Corp. The Kinney Heliquad is a slow speed, high efficiency rotary pump of unique design, employing steep helical rotors which are ideal for handling heavy oils and other viscous and non-viscous materials. Find out how this super-dependable pump can help in your plant. Send coupon for details. Kinney Manufacturing Co.—manufacturers of liquid and vacuum pumps. Representatives throughout the United States and in foreign countries.

KINNEY MFG. CO. • SUBSIDIARY
THE NEW YORK AIR BRAKE COMPANY
3573 WASHINGTON STREET • BOSTON 30 • MASS.

Please send Bulletin L-51 describing the complete line of Kinney Liquid Pumps.

NAME _____
COMPANY _____
STREET _____
CITY _____ STATE _____

When inquiring check CP 5542 on handy form, pgs. 2-3

Chemical Show Preview, A Supplement

Supplementary information on new products to be exhibited at the Twenty-Fourth Exposition of Chemical Industries. Received too late for inclusion in November issue

American Machine & Foundry Co., New York, N. Y. MIXING MACHINES

Continuous mixing machine and planetary type vertical mixing machines for batch and continuous processing.

American Machine and Metals, Inc., East Moline, Ill.

FILTERS, CENTRIFUGALS

Filter, designed for liquid clarifications in which recovery or disposal of solids is an important factor; a continuous centrifugal, laboratory model centrifugal, belt-driven centrifugal, and direct-motor driven centrifugal.

American Optical Co., Instrument Div., Buffalo, N. Y.

SPECTROPHOTOMETER, METALLOGRAPH

Rapid scanning spectrophotometer is adaptable to many materials, and is said to plot complete absorption curve instantaneously. Desk-type metallograph is designed for rapid, routine examination and photography of metallic specimens.

Metallograph features complete instrument operation from sitting position, built-in flat-field photographic eyepieces, and "Autofocus" stop.

The American Platinum Works, Newark, N. J. LABORATORY APPARATUS

Wide range of platinum apparatus for scientific laboratories, including crucibles, dishes, and electrodes. Included will be various platinum and palladium catalysts, as well as salts and solutions of the platinum group metals. Also featured will be silver products for the chemical industry.

Barber-Colman Co., Wheelco Instruments Div., Rockford, Ill.

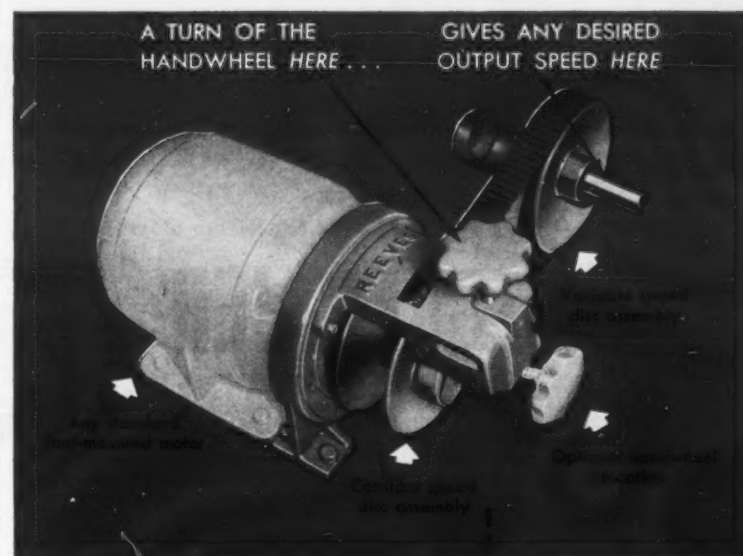
INSTRUMENTS

Exhibit will feature instruments for indicating, controlling, and recording temperatures and other

(Continued on next page)

NEW! REEVES Flexi-Speed Drive

Mounts in any position . . . drives in any direction
. . . gives any speed within 8:1 range. Low Price!



New REEVES Flexi-Speed Drive is the most versatile variable speed drive on the market today. Drives in any direction. Mounts in any position—above, below or beside the driven machine—practically without limitation. Speed control handwheel and driven shaft may be located anywhere around the motor shaft. Six different length belts offer a wide choice of shaft center distances.

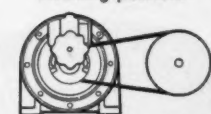
For all these reasons, REEVES Flexi-Speed Drive is the easiest, most practical, and economical way of converting any constant speed motor to an infinitely variable speed drive with 8:1 speed range. May be used with any standard ball bearing, foot-mounted motor of 1/2, 3/4 or 1 hp. Identical in working principle to the time-tested REEVES Motodrive, the Flexi-Speed Drive consists of constant speed disc assembly, variable speed disc assembly, double-cog belt and versatile shifting mechanism.

REEVES Flexi-Speed Drive is ideal for driving to standard gear reducers for parallel drive, on worm gear reducer for inexpensive right angle drive. Its versatility assures maximum production with the greatest efficiency and economy in your machines. Write today for complete details. Specify Dept. CP90a-V532.

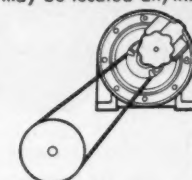
REEVES PULLEY COMPANY, COLUMBUS, INDIANA



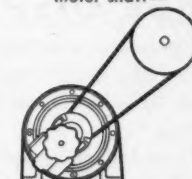
Some of the mounting positions



Handwheel control may be located anywhere



360° around motor shaft—



Belt may drive in any direction



When inquiring check CP 5543 on handy form, pgs. 2-3



Put This Sump Pump on your toughest job!

That's what it's built for . . . the most difficult sump pumping operations ever encountered. It takes all ordinary jobs easily in its stride. Handles acid sludges, corrosive and foamy products with solids in suspension. Suitable for abrasive pulp and acid transfer in mills and smelters, floor cleanup in chemical plants, draining and filling acid tanks. Completely rubber lined and covered for acid handling.

The Galigher Sump Pump has no submerged bearings or packings that often cause trouble. Oversize particles are effectively screened out. Pump has no tendency to airlock. Handles heads up to 35' and flows up to 75 g.p.m. Write us for full details.

We also have the full line of VACSEAL PUMPS — vertical and standard types. Ask for illustrated bulletin.

Leaders in Experience & Service

THE GALIGHER CO.

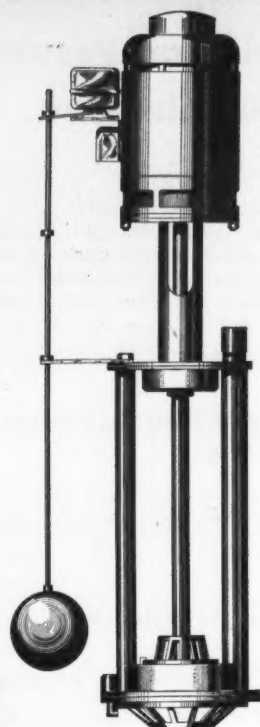


CONSULTATION • ORE TESTING
PLANT DESIGN • GEOLOGIC INVESTIGATION

HOME OFFICE: 545 West 8th South, Salt Lake City, Utah, P. O. Box 209.

EASTERN OFFICE: 921 Bergen Avenue, Jersey City, New Jersey
Agents in All Principal Foreign Mining Districts

When inquiring check CP 5544 on handy form, pgs. 2-3



GALIGHER SUMP PUMP

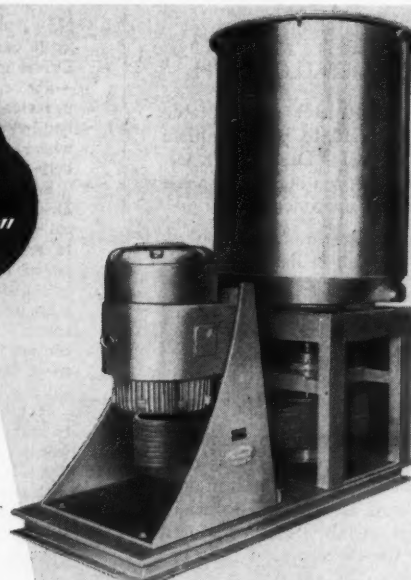
"Gives Us an Emulsion
of Very Fine and Uniform
Particle Size without Homogenizing"

That's the comment of a large pharmaceutical company on the results they are getting with

ABBÉ DISPERSALL MIXERS

It points up the job that this Mixer does in breaking up and dispersing liquid globules, and agglomerations of solids *in addition* to much faster and more thorough mixing.

If you are interested in the probability of making your mixing operations a ONE stage process, write for a copy of Bulletin 68.



The mix is pulled down through the rapidly rotating milling element with the cupped rotor-stator. Here impact and shear break up agglomerations of solids and liquid globules to speed up the dispersion of the mix.

ABBÉ ENGINEERING CO. • 46 CHURCH STREET, NEW YORK 7, N. Y.

Makers of

ABBÉ ENGINEERING Ball, Pebble and Jar Mills

When inquiring check CP 5545 on handy form, pgs. 2-3

CHEMICAL SHOW PREVIEW

(Continued from preceding page)

process variables. Flame controls used for safe firing of oil and gas in all types of heating.

Barnebey-Cheney Co., Columbus, Ohio

ACTIVATED CARBON

Complete line of activated carbon, air purification units, and industrial absorption systems will be displayed.

Bramley Machinery Corp., Edgewater, N. J.

MIXING MACHINERY

Large production size mixer-disperser-kneader, a laboratory unit of the same type, and operating models. Recently introduced vertical change-can mixer is to be featured.

Central Scientific Co., Chicago, Ill.

LABORATORY EQUIPMENT

High speed oil diffusion pump; high vacuum backing pump; a complete line of couplings and connectors; Kool-Grip Kjeldahl flask; surface cooler attachment for increasing usefulness of Waring blenders; midget industrial thermometers; thermoelectric heating tapes; a consistometer; and a moisture balance that quickly indicates moisture in many materials by simultaneous infrared drying and torsion balance weighing.

Centrico, Inc., Englewood, N. J.

CENTRIFUGALS

Featured will be a demonstration of a centrifugal separator, which makes desludging an automatic operation by eliminating use of valves by means of an automatic opening and closing bowl to permit continuous discharge of drier sludge.

Arthur Colton Co., Div. of Snyder Tool & Engineering Co., Detroit, Mich.

PACKAGING MACHINERY

Dry blender will be featured. Unit's construction is said to be such that correct blending angles are given for every application. High production strip packaging unit will be shown, as well as rotary tabletting and slugging presses, rotary granulator, and stainless steel tanks for cooling or heating materials during processing.

Combustion Engineering, Inc., New York, N. Y.

BOILERS

Packaged boiler units for all types of steam requirements from 4000 to 30,000 lb/hr; controls and accessories.

Croll-Reynolds Co., Inc., Westfield, N. J.

EJECTOR, EVACTOR

Single stage ejector made entirely of Havg, and a single stage evactor with all internal parts made of carbon. Also on display will be an illuminated transparent view of a complete vacuum refrigerating system.

Dean Products, Inc., Brooklyn, N. Y.

PLATE COILS

Exhibit will introduce plate coils said to be an effective substitute for pipe coils in tank heating and cooling. Featured will be a technical clinic for study of application of plate coils.

The Duriron Co., Inc., Dayton, Ohio

PUMPS, VALVES, AND EXHAUST FANS

Corrosion-resisting centrifugal pumps, with capacities to 3000 gpm and heads to 250 ft; valves for a variety of applications; and line of exhaust fans for industrial use.

Emsco Manufacturing Co.,
Los Angeles, Calif.

LIQUID HANDLING EQUIPMENT

Swivel fittings, gear driven loading arms, and steel hose for handling chemicals. This equipment finds use on loading racks, dock equipment, with high temperature and corrosive products, and features ball bearing assembly, special packings.

Ess Instrument Co., Bergenfield, N. J.

INSTRUMENTS

Turbidity indicators and recorders, belt slack controllers, and haze recorders will be shown.

Flexonics Corp., Maywood, Ill.

FLEXIBLE HOSE AND COUPLINGS

Expansion joints with Kel-F protective coating; corrosion-resistant, stainless steel straight wall tubing; flexible metal hose; and brass and stainless steel elbows.

Fulton Bag & Cotton Mills,
Atlanta, Ga.

BAGS

Exhibit will feature bags of multiwall paper, water-proof paper-lined burlap, cotton, and polyethylene. Products are reported water-proof, acid- and alkali-proof, oil-proof, and sift-proof.

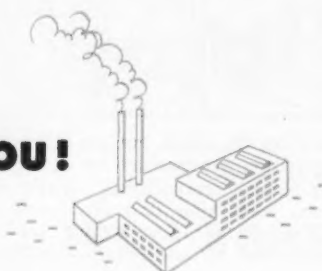
(Continued on next page)

THE LABORATORY

USES PORCELAIN



SO CAN YOU!



In putting new processes into production, there's no need to compromise with purity because industrial-scale equipment won't duplicate laboratory results . . . Nor to search for substitute materials that will produce equivalent results. Why not use the same materials in which the laboratory worked out the process?

Chemical Porcelain, world-wide standard for laboratory purity, is available from Lapp in equipment for pilot-plant and industrial production. In a wide variety of valve styles, in pipe and fittings, in towers and raschig rings, and many special shapes. It costs much less initially than special alloy or lined equipment, and, even in cases of most severe acid corrosion, usually requires no maintenance.

If you're unusually concerned about protection of product, plant, or personnel against accident or carelessness, specify Lapp Chemical Porcelain with TUFCLAD armor (multiple layers of heavy fiberglass fabric bonded with an Epoxide resin). TUFCLAD serves as protection against impact, insulation against thermal shock—and is of itself strong enough to hold operating pressures even if porcelain is cracked or broken.

For severe corrosion service, or where no metallic contamination can be tolerated, join the hundreds who have found Lapp Chemical Porcelain the only satisfactory—and most economical—processing material.

WRITE for description and specifications. Lapp Insulator Co., Inc.,
Process Equipment Division,
166 Wendell St., Le Roy, N. Y.

Lapp

CHEMICAL PORCELAIN



When inquiring check CP 5546 on handy form, pgs. 2-3

Is Your Factory Starved for AIR?

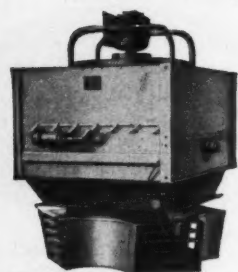


If this is what happens when you go from the office out into the shop, your plant is starved for air! The vacuum created by the operation of necessary exhaust equipment is usually responsible. While our pictures may be slightly overdrawn, something like that may be happening in your plant. Perhaps not so noticeably, for if your building is not new, the vacuum may be relieved by crevices, loose-fitting windows, open doors.

When that happens, your ventilating system, so painstakingly designed and installed to protect your employees and to increase production, can't work properly. And your heating system won't work properly because cold air is being drawn in through every crack and crevice and every opened door.

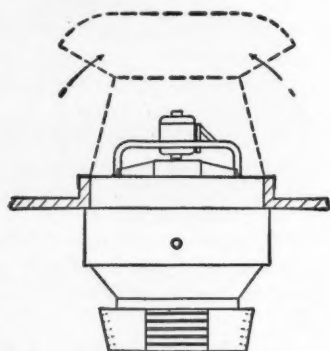
There is an easy solution. Install WING FRESH AIR SUPPLY HEATERS with Revolving Discharge Outlets. In winter they bring in fresh air through heating coils varied to just the right temperature, replacing exhausted air. In summer, with the steam turned off, they circulate the air in your plant, giving a cool, refreshing sensation to the workers and keeping production up to normal in stifling weather.

WING FRESH AIR SUPPLY HEATERS



Wing Fresh Air Supply Unit with fan enclosed in casing.

(Right) WING Fresh Air Supply Unit with fan above roof line.

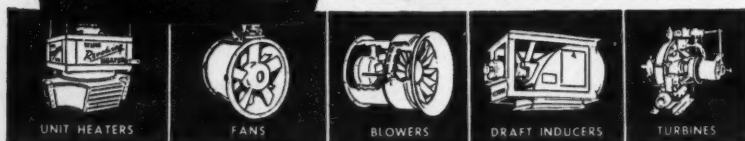


Write for Bulletin HVT-1 and learn the facts about fresh air make-up for your plant.

L.J. Wing Mfg. Co. Linden, N.J.
179 Vreeland Mills Road

Factories: Linden, N.J. & Montreal, Canada
In Europe: Etab. Wanson, Brussels, Belgium

Wing



When inquiring check CP 5547 on handy form, pgs. 2-3

CHEMICAL SHOW PREVIEW

(Continued from preceding page)

General American Transportation Co.,
Chicago, Ill.

CHEMICAL PLATING PROCESS, PROCESSING EQUIPMENT HOPPER CAR

Chemical plating process, said to make possible use of nickel-plated carbon steel and other base materials in place of more costly corrosion-resistant metals, will be featured. Also displayed will be pilot plant size evaporators; rotary leaf pressure filter; pilot plant dryer; dry seal gasholder; an extraction unit; and a covered hopper car for bulk shipping of materials.

The Girdler Co., Louisville, Ky.
PROCESSING EQUIPMENT

Plastic model of processing unit used for continuous chilling, freezing, mixing, aerating, cooling, pasteurizing, and sterilizing operations; operating tableting machine producing catalysts; various types of catalysts.

Hardinge Co., Inc., York, Pa.
PROCESSING EQUIPMENT

Presentation will include an animated display of air classifier, and a full-size tray belt filter; working models of automatic backwash sand filter, "Auto-Raise" thickener, and rotary dryer.

Hetherington & Berner, Inc., Indianapolis, Ind.
FLUIDOMETER, GATE VALVE

Working model of fluidometer system for batching light or heavy viscous materials will be featured. An all-jacketed gate valve will also be shown.

Homestead Valve Mfg. Co.,
Coraopolis, Pa.

VALVES

Line of plug valves for different applications, with various types of seals, several working capacities.

Ingersoll-Rand Co., New York, N. Y.

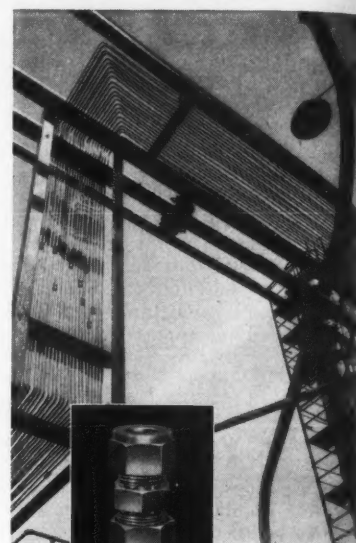
VALVES, COMPRESSORS, CONDENSERS & EJECTORS, PUMPS, TOOLS

Forty different valves for compressor applications; cutaway model of non-lubricated compressor; plastic model of condenser and cutaway model of steam-jet ejector; various types of centrifugal pumps; and air and electric tools, such as chippers, riveters, pumps, drills, and hoists.

Also on display will be paving breakers and rock drills, for maintenance and production work.

Swagelok®

THE VITAL UNION

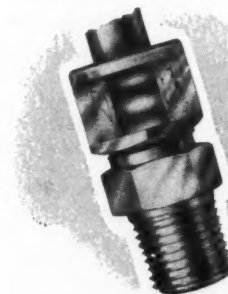


for all
instrumentation and
process piping lines

Swagelok Tube Fittings give you torque-free, leakproof seals at all connections, freeing you of those bothersome small leaks in instrumentation and process piping lines. Testing by "soaping" is unnecessary. Shut-downs are avoided.

Swagelok Tube Fittings are available in a wide variety of sizes from 1/8" up in brass, aluminum, steel, stainless steel and Monel. Other machinable metals can be furnished when required.

FREE—Send for the Swagelok Catalog today. Address Dept. 482.



SWAGelok FITTINGS AVAILABLE IN:
BRASS, ALUMINUM, STEEL, STAINLESS STEEL, MONEL

CRAWFORD FITTING CO.

884 East 140th Street Cleveland 10, Ohio
Teletype CV-785

When inquiring check CP 5548
on handy form, pgs. 2-3

CHEMICAL PROCESSING

**La Wall and Harrison, Philadelphia, Pa.
RESEARCH TECHNIQS**

Equipment and procedures employed in chemical, bacteriological, and pharmacological research on foods, drugs, and new chemicals.

**Link-Belt Co., Chicago, Ill.
DRYER, CONVEYORS**

Display will feature a dryer, in plastic, and its accessories, with material being circulated to show dry cycle.

**Merco Centrifugal Co., San Francisco, Calif.
CENTRIFUGALS**

Display will feature huge centrifugal bowl for concentration or clarification applications. A desludger for the food and chemical industries. Sharing the booth with Merco will be Westfall Separator A.G. of Westfalia, Germany. They will display a machine (the TrT) resembling a centrifugal screen, which has an action said to give maximum drying effect without damaging fragile crystals.

**Michigan Pipe Co., Bay City, Mich.
PIPE AND FITTINGS**

Wide size range of corrosion-resistant pipe lined with wood, Saran rubber, porcelain enamel, or stainless steel; unlined pipe, tubing, fittings, assemblies; and complex piping shapes.

**Minneapolis-Honeywell Regulator Co.,
Philadelphia, Pa.**

INSTRUMENTS

Radiation-type potentiometer unit and strip chart recorder will be featured. Millivoltmeter-type controllers, miniature instruments, flow meter receiver and integrator, 90-point scanner.

**Mission Mfg. Co. Houston, Tex.
CENTRIFUGAL PUMPS**

Complete line of centrifugal pumps will be exhibited. Recently introduced solid plastic centrifugal pump to be featured.

**Norton Co., Worcester, Mass.
REFRACTORY PRODUCTS, POROUS MEDIA**

Catalyst supports of both the fluid and fixed bed types; porous media for diffusion, aeration, and

(Continued on next page)

THESE EXCLUSIVE PRECISION-MACHINED GUIDES

eliminate chatter

lengthen service life

**IN LUNKENHEIMER
IRON BODY GATE VALVES**

Gate valve chatter — the sound of wasteful, accelerated wear — is eliminated by Lunkenheimer's unique method of manufacturing Iron Body Gate Valves. Not only are the guide channels in the disc accurately machined, but the guides in the body as well. These precision-machined guides hold the disc firmly in line — prevent pressure from forcing the disc against the opposite seat. Result: no clatter, no chatter, and much longer valve life. The complete Lunkenheimer Iron Body Gate Valve line includes 3% Nickel Iron Gate Valves (Fig. 1578N-4) designed especially for mildly corrosive service in the oil, paper, and chemical processing industries. They have 18-8 Mo (Type 316) Stainless Steel and Monel Trim to protect the seating faces. All Lunkenheimer Iron Body Gate Valves feature solid discs without pockets that might trap congealing substances in the line. They also have handy swing-bolts and shelves that make repacking easy — are ideal for service in the chemical, petroleum, and pulp processing fields.

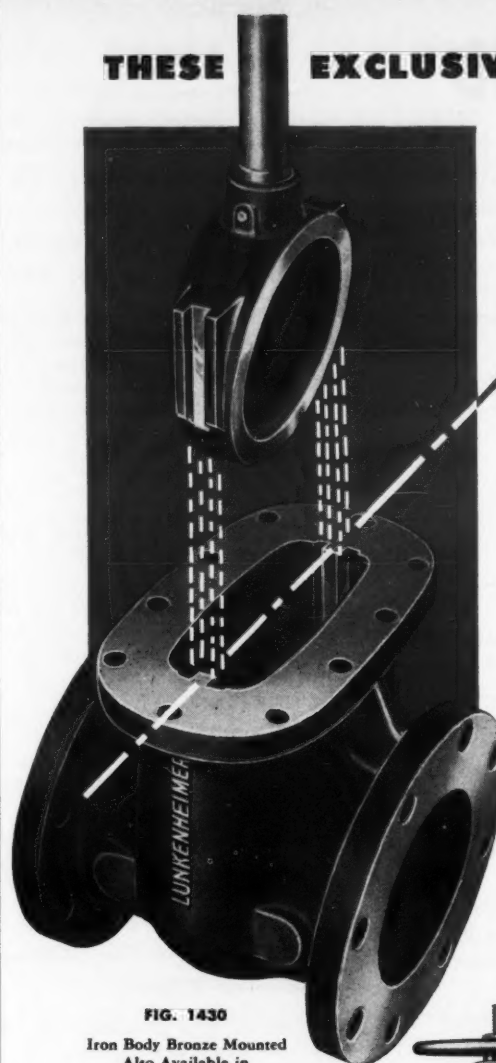
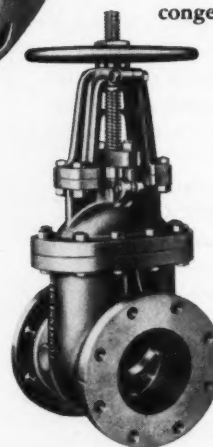


FIG. 1430

Iron Body Bronze Mounted
Also Available in
FIG. 1576 and 1578
All Iron
Screwed and Flanged Types
Fig. 1578N-4
3% Nickel Iron with
18-8 Mo (Type 316) Stainless Steel Trim

**WRITE FOR Circular 564, describing
the complete Lunkenheimer Iron Body
Gate Valve line. Address: The Lun-
kenheimer Co., Box 360C, Cincinnati
14, Ohio, or phone your Lunkenheimer
Distributor.**



IRON • STEEL • BRONZE

LUNKENHEIMER®
THE ONE Great NAME IN VALVES

When inquiring check CP 5549 on handy form, pgs. 2-3

NOW! LATTICE BRAID* PACKING WITH TEFLON†



An Exclusive GARLOCK Shaft and Rod Packing

LATTICE BRAID packing (a patented Garlock product) is braided through and through to give it strength, flexibility, resiliency, and long life. Teflon (a du Pont product) is unaffected by caustics, process liquids, solvents, acids or chemicals of any kind.

Garlock combines these two products by impregnating each strand of LATTICE BRAID asbestos packing with Teflon suspensoid. The result is a sturdy braided asbestos packing with a heavy, thoroughly distributed Teflon impregnation which is unaffected by the liquid being handled. This long-life packing has a low coefficient of friction, is non-corrosive and non-contaminating.

LATTICE BRAID with Teflon is available in either Canadian white asbestos (Style 5861) or blue African asbestos (Style 5880). Garlock also manufactures all-Teflon LATTICE BRAID packing, plastic packings of shredded Teflon, and other Teflon products.

For complete information, write us or contact your Garlock representative.

THE GARLOCK PACKING COMPANY
PALMYRA, NEW YORK

In Canada: The Garlock Packing Company
of Canada Ltd., Toronto, Ont.

Branch Offices in Most Principal Cities

*REGISTERED TRADEMARK
†The Du Pont Company's Trademark



GARLOCK

PACKINGS, GASKETS, OIL SEALS,
MECHANICAL SEALS,
RUBBER EXPANSION JOINTS

When inquiring check CP 5550 on handy form, pgs. 2-3

CHEMICAL SHOW PREVIEW

(Continued from preceding page)

filtration. Recently announced heating elements will be shown and literature concerning them will be available.

Oliver United Filters, Inc., New York, N. Y. CENTRIFUGALS, FILTERS, PUMPS

Feature is a unit said to be a unique combination of liquid cyclone and centrifuge, designed for separation of solids of different particle sizes, or specific gravities, while suspended in a liquid slurry within unit. Seven different filter models, plus acid handling and diaphragm slurry pumps will be displayed.

Pacific Valves, Inc., Long Beach, Calif. VALVES

Display will include valves for handling highly corrosive liquids or gases and for operation in corrosive atmospheres. Cutaway model valves will be operating.

Photovolt Corp., New York, N. Y. PHOTOELECTRIC INSTRUMENTS

Colorimeters, fluorimeters, densitometers, reflection meters, glossmeters, pH meters, and photometers of high sensitivity will be featured.

Productive Equipment Corp., Chicago, Ill. VIBRATING SCREENS

Selectro screen in production size and a small unit, used for pilot plant operation, which will demonstrate actual handling of materials.

Read Standard Corp., York, Pa. BLOWERS, MIXERS

Axial flow blower, featuring high efficiency and low sound level; double arm horizontal mixer with overlapping action; spiral ribbon mixer with vacuum operation; and a planetary action vertical mixer.

T. Shriver & Co., Inc., Harrison, N. J. FILTERS, PUMPS

Filters for general handling of difficult fluids, and a diaphragm pump. There will also be a pictorial display of different types of this equipment.

Simplicity Engineering Co., Durand, Mich. GYRATING SCREENS

Feature is a tray-type screen suitable for fine sizing

for *Low*
VACUUM PUMP
MAINTENANCE
COSTS and BETTER
VACUUM...

it's the

HILCO OIL RECLAIMER

VACUUM
for PUMP
USERS..



Oil Reclaimer

A simple, economical and efficient method of restoring contaminated lubricating and sealing oil to the full value of NEW OIL. The HILCO will produce and maintain oil free of solids, gums, water and gases in a continuous, all-electric, automatic operation.

Be SURE of clean oil in your
HIGH VACUUM PUMPS

HILCO
OIL RECLAIMER
SYSTEMS..

• WRITE FOR COMPLETE DETAILS
IN THE FREE BULLETIN

Recommendations at no Obligations

THE HILLIARD
CORPORATION
A HILCO DIVISION

58 W. Fourth St., Elmira, N. Y.

IN CANADA — UPTON-BRADEEN-JAMES, Ltd.
990 Bay St., Toronto, 3464 Park Ave., Montreal

When inquiring check CP 5551
on handy form, pgs. 2-3

CHEMICAL PROCESSING

or dewatering of any type of liquid. Also displayed will be a positive vertical action compacting unit.

The Torsion Balance Co., Christian Becker Div., Clifton, N. J.

BALANCES

Featured will be analytical and torsion balances used for precision weighing in research, control laboratories, and in production control.

Troy Engine & Machine Co., Troy, Pa.

MILL, MIXER

Triple action colloid mill for difficult dispersion or emulsion processes; an operating model of an angular mixer said to have a unique mixing action and a variety of applications.

Tube Turns, Inc., Louisville, Ky.

WELDING FITTINGS

Display will feature welding fittings and flanges that have a variety of uses in many industries. Fittings are said to be particularly useful wherever conditions require that piping be strong, resistant to corrosion, and leakproof. Easy to install, insulate, and maintain.

Tote System, Inc., Beatrice, Nebr.

MATERIALS HANDLING EQUIPMENT

A bulk materials handling system for inter-plant shipment or in-plant operations. System includes air-tight containers, dust-tight discharging equipment with batching, weighing and blending equipment when desired, dust-tight filling equipment.

Photomultiplier attachment increases sensitivity of spectrophotometer

Used in the 320 to 600 millimicron range, photomultiplier attachment provides a manyfold increase in the sensitivity of manufacturer's Model B spectrophotometer. The attachment permits measurement of low light levels in transmission and reflectance work. In flame photometry, it allows the chemist to analyze traces of many elements routinely.

Specifications, features and applications of the Model B Photomultiplier Attachment are outlined in two-page bulletin.

Data File 331-11 is issued by Beckman Instruments, Inc., Dept. CP, 820 S. Mission St., S. Pasadena, Calif. When inquiring specify CP 5551A on handy form, pages 2 and 3.

For controlled heating of liquids and gases

CHROMALOX

Electric Circulation Heaters

including

- Water, oils and heavy fuel oils.
- Nitrogen, steam, air and other gases.
- Aroclor, Dowtherm, Prestone and other heat-transfer mediums.

Chromalox Electric Circulation Heaters are "packaged" heaters ready to install and connect wherever you need dependable heat that is efficient, economical and easy to use. They give you measured quantities of heat up to 750° F. that can be accurately controlled and maintained around the clock. May be used in series. Available in capacities from 1 kw. to 100 kw. in standard voltages.

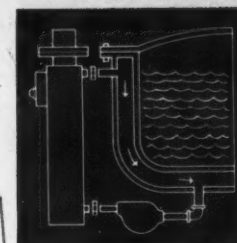
CHROMALOX CATALOG 50

contains complete data on Chromalox Circulation Heaters for all applications. Write for your copy today.

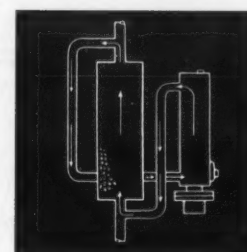


CHROMALOX

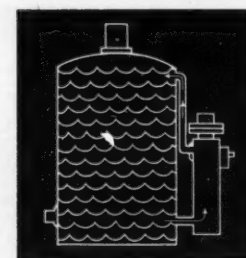
Electric Heat for Modern Industry



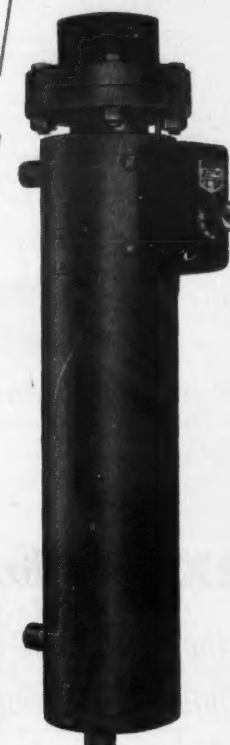
Circulation heater connected to jacketed process kettle.



Circulation heater as part of nitrogen heating assembly for reactivating alumina.



Circulation heater connected to water tank as "side-arm" heater.



This coupon will bring you catalog 50

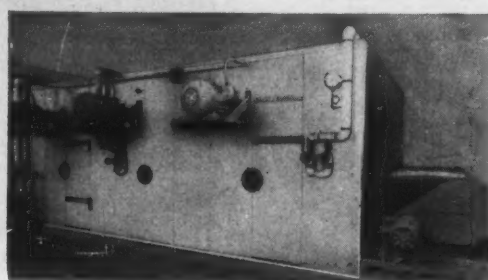
Industrial Division, EDWIN L. WIEGAND COMPANY
7517 Thomas Boulevard, Pittsburgh 8, Pa.

IC-73

Please send me Catalog 50.

Name _____
Company _____
Street _____
City _____ Zone _____
State _____

When inquiring check CP 5552 on handy form, pgs. 2-3



"NATIONAL" CONVEYOR DRYER

Engineered to assure unequalled uniformity and speed under critical drying conditions, and to provide the lowest possible cost per unit of product dried.

Sizes range from small, compact 8' x 12' units to 300' long tunnel type constructions. Single or multiple apron — perforated, solid, wire mesh or slat. Cross, vertical, through or reverse circulation, or any combination.

Special features include flexibility of operation, ease of maintenance, and unit construction for economical future expansion.

Write for Complete Information

Chemical Dryers of
All Types and Sizes



Special Drying and
Heating Equipment

THE NATIONAL DRYING MACHINERY CO.
2709 N. Hancock Street, Philadelphia 33, Pa.

When inquiring check CP 5553 on handy form, pgs. 2-3



Johnson
Direct Operated
Solenoid
Valves

Here, for the first time, is a valve built for heavy duty service, yet incorporating the inherent simplicity and immediate response of the solenoid principle. Operates dependably under differential pressures to 150 lbs., temperatures to 400°—without use of auxiliary pistons or pilot valves. Finding new uses every day, handling steam, liquid, air, gases, and particularly heavy viscous liquids.

Available in sizes 1/2" to 3", with stainless steel valve and seat or Jenkins disc construction; for normally closed or normally open service. Find out where you can use it; write for Bulletin "V"

The Johnson Corporation

826 Wood St., Three Rivers, Mich.

When inquiring check CP 5554 on handy form, pgs. 2-3

MIX IT better... MIX IT faster... MIX IT with a

... the TUMBLING ACTION mixer for intimate blending of dry ingredients

MUNSON

Rotary Batch Mixer

For intimate, accurate mixing of dry ingredients in the shortest time—the Munson Rotary Batch Mixer has proved its value on hundreds of different applications. Will not stratify ingredients—will not alter characteristics of basic components. Its famous 7-way mixing action, plus lower horsepower requirements and low operating costs, make the MUNSON first choice for performance and economy!

**NO OTHER
MIXER HAS
THIS
MULTIPLE-
BLENDING
ACTION!**



Lifters on inside of truncated cone ends continuously cut out and lift ingredients as drum slowly revolves. Rotating cone tumbles stock toward center. Conveyor flights on mixer shaft also stir and agitate stock back to center of drum—where mixing cycle repeats.



**UNEQUALLED FOR
DRY MIXING OF:**

Chemicals,
Fertilizers, Feeds,
Cereals, Gelatin,
Glue,
Soap Compounds,
etc.

Munson Rotary Batch Mixers are available in capacities from 40 to 200 cu. ft. The basic Munson design can be altered to fit your individual requirements—for overhead, working floor or basement installation. Munson engineers—skilled in processing procedures—will be glad to assist in solving your mixing problem. For full information, write us today...

Other famous MUNSON products: Rotary Knife Cutters, Hammer Mills (25 to 100 HP), Attrition Mills (24" to 30"), Rotary Crushers...

MUNSON MILL MACHINERY CO. Dept. P-1253 Utica, New York

When inquiring check CP 5555 on handy form, pgs. 2-3

New Literature

Automation — as seen by management

Fifty-five-page paper-bound book deals with developments in automation and is the result of a panel session of the American Management Association.

Scope of the book can be gathered from four chapter headings; "Problems in the Push-Button Factory," "Mechanization of Small-batch Production," "The Role of Design in Automation," and "Effecting a Continuous Flow of Process Materials." Original papers are followed in each case by a panel discussion.

To obtain "Automation and Other Technological Advances," remit \$1.25 direct to American Management Association, Dept. CP, 330 West 42nd St., New York 36, N. Y.

Sums up details on evaporator for "difficult" materials

Charts, pictures and text of 12-page 2-color bulletin describe use, construction and operation of turbulent-film type evaporator. The unit is said to be particularly advantageous for processing heat-sensitive, frothy or viscous liquids, and is easily cleaned because of its simple stainless steel design. Table provides typical heat transfer results for food products. Bulletin contains details of all five production models and a portable lab unit.

Bul 353 is issued by Rodney Hunt Machine Co., Dept. CP, 43 Vale St., Orange, Mass. When inquiring specify CP 5556 on handy form, pages 2 and 3.

Describes control relay using electronics

Illustrated specification sheet pictures sensitive electronic relay and describes it. Bul 26 is issued by Electro-Physics Co., Dept. CP, 287 Broadway, New York 7, N. Y. When inquiring specify CP 5557 on handy form, pages 2 and 3.

Shows equipment for chemical flocculation

Conveying and mixing equipment for chemical flocculation in water and waste treatment plants is described in 8-page illustrated booklet. Installation photos show many types of conveying and elevating equipment for handling bulk or packaged chemicals. Two types of mechanical

mixers, for fast and slow mixing action, are described in detail. Inserts contain general arrangement drawings and specifications. Tested layouts and selection tables to aid in determining suitable tank size for required flow are included.

Book 2442 is issued by Link-Belt Company, Dept. CP, 307 N. Michigan Ave., Chicago 1, Ill. When inquiring specify CP 5558 on handy form, pages 2 and 3.

Describes analytical applications of X-ray diffraction technique

According to descriptive bulletin, X-ray diffraction techniques provide non-destructive methods of analysis which open many approaches for laboratory investigation. Among the many applications which are listed are studies of crystalline structure, uses in metallurgical investigations, chemical analysis, and applications in the process industries.

Advantages and applications of this technique are outlined and basic principles of method are discussed. Numerous photos and charts show types of equipment and typical diffraction patterns.

Bul 8A-3162 is issued by General Electric X-Ray Corp., Dept. CP, 4855 Electric Ave., Milwaukee 14, Wis. When inquiring specify CP 5559 on handy form, pages 2 and 3.

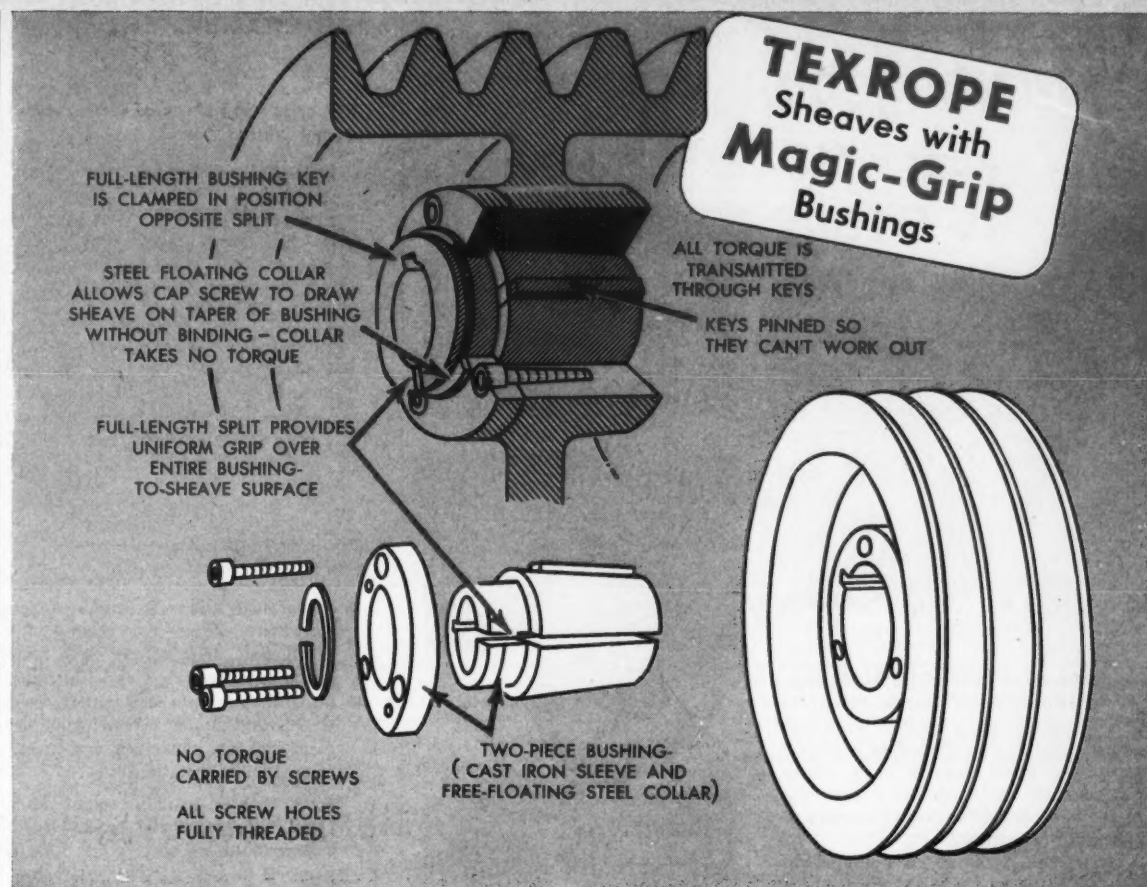
Liquid linings and coatings

Manufacturer's tank and drum linings and two vinyl coatings are described in four-page bulletin. Liquids are said to provide excellent protection against corrosive chemicals and fumes. Flexibility and adhesion are the two prime features of the drum linings.

Gaco Vinyl Liquid Linings and Coatings is issued by Gates Engineering Co., Dept. CP, P. O. Box 1711, Wilmington, Del. When inquiring specify CP 5560 on handy form, pages 2 and 3.

Covers remote reading units for liquid level

Illustrated 18-page bulletin explains and describes instruments for remote reading of liquid level. Standard and a host of special models are pictured. Accessory equipment for control and alarm is also featured. Bul CP-3003 is issued by Vapor Recovery Systems Co., Dept. CP, Compton, Calif. When inquiring specify CP 5561 on handy form, pages 2 and 3.



Get the Only Sheave with ALL the Most Needed Features

Here's Comparison of Magic-Grip Sheave and Other Sheaves

	Magic-Grip Sheaves	SHEAVE A	SHEAVE B	SHEAVE C
Bushing fully split for uniform clamping action.	Yes	Yes	No	Yes
Load carried by keys instead of threaded bolts.	Yes	No	No	No
Bushings cover full range of NEMA "probable" shaft diameters.	Yes	Yes	Yes	No
All screws engage full thread.	Yes	Yes	Yes	No
Mounts in one piece.	Yes	No	Yes	Yes
Squares itself with shaft.	Yes	No	No	No

Texrope and Magic-Grip are Allis-Chalmers trademarks.

ALLIS-CHALMERS

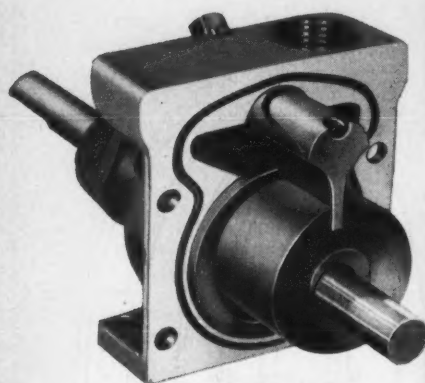
MILWAUKEE 1, WISCONSIN



When inquiring check CP 5562 on handy form, pgs. 2-3

interchangeable impellers

ADAPT ALL-CHEM PUMPS TO SPECIFIC REQUIREMENTS



While standard ALL-CHEM Pumps are of ALL-TEFLON and STAINLESS STEEL Construction—impeller materials may be varied to gain advantage in higher pressures or lower costs or both, where these alternate materials are compatible with the fluids to be handled. Consult our engineering department.

This interchangeability is possible because all ECO ALL-CHEM Pumps are precision manufactured to close tolerances so that every part will fit with any other part in any pump with the same serial number whether in Newark or New Delhi.

A great boon to ECO pump users when a handful of replacement parts can put a line of pumps back into top condition with a minimum of time and labor, many miles from our plant.

Outstanding Characteristics: Lowest cost quality pump for All-Chem service. Positive displacement with two opposed axially oscillating impellers equivalent to duplex piston operation. No air-entrainment, non-foaming, lowest corrosion rate of any stainless steel pump, highest suction lift over widest temperature and viscosity range, self-priming on non-volatile liquids. Applicable to direct motor drive at 1725 RPM and to all other standard driving methods.

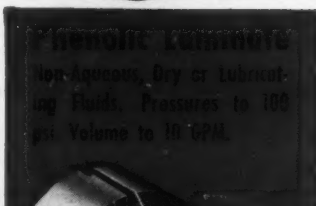
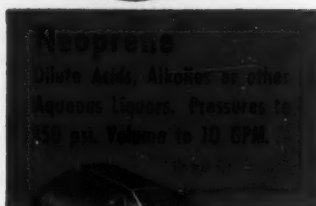
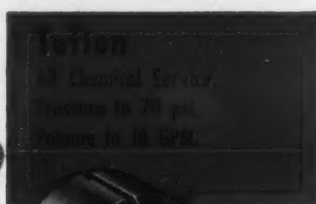


ECO

ENGINEERING COMPANY

12 New York Avenue • Newark 1 • New Jersey

When inquiring check CP 5563 on handy form, pgs. 2-3



NEW LITERATURE

Presents nine sizes of water-tube steam generators

Data and specifications for complete, factory assembled water-tube steam generator units in nine sizes, ranging from 5300 to 33,000 lb of steam per hr; for pressures up to 400 psi, designed to provide fully automatic firing with gas, oil, or stoker-fired coal, are described in an eight-page, illustrated catalog.

Cat on Type A Water-tube Steam Generators is available from Dept. W, Superior Combustion Industries, Inc., Dept. CP, 1475 Broadway, New York 36, N. Y. When inquiring specify CP 5564 on handy form, pages 2 and 3.

Deals with self-contained water conditioning unit

A versatile and self-contained unit, designed to chlorinate, coagulate, clarify, filter, neutralize, de-alkalize and soften raw water supplies is graphically described and illustrated in eight-page bulletin. It lists component parts of complete water conditioner, details principles of operation, gives ratings, capacities and sizes and illustrates some typical installations.

Bul 3869 is available from The Permutit Co., Dept. CP, 330 W. 42nd St., New York 36, N. Y. When inquiring specify CP 5565 on handy form, pages 2 and 3.

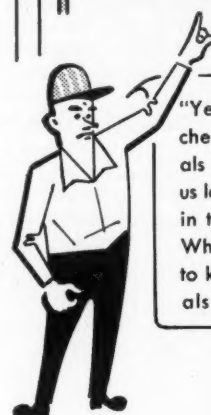
Summarizes info on hydraulics for industrial machinery

Recommendations for hydraulic oil selection and basic hydraulic system maintenance on machine tools and other industrial machinery are offered in manufacturer's bulletin. Reviewed are important characteristics of hydraulic oils, hydraulic system operation under normal and extreme temperature and humidity conditions, and general maintenance procedures for manufacturer's complete line of industrial hydraulic equipment. A table of common hydraulic system difficulties and corrective action for each is included.

Bul 1300-S is available from Vickers, Inc., Div. of Sperry Corp., Dept. CP, 1582 Oakman Blvd., Detroit 32, Mich. When inquiring specify CP 5566 on handy form, pages 2 and 3.

Reviews ASTM research

Review of ASTM research as published in December 1952, through February 1953 ASTM bulletins is issued by Administrative Committee on Research, American Society for Testing Materials, Dept. CP, 1916 Race St., Philadelphia 3, Pa. When inquiring specify CP 5567 on handy form, pages 2 and 3.



"Yes, stubborn chemical materials are causing us lots of trouble in these bins. What can we do to keep materials moving?"



"Install a CLEVELAND vibrator. Granular or powdered chemical materials will start moving in a hurry. We'll show you how."

Catalog No. 109 on request



2706 Clinton Ave. • Cleveland 13, Ohio

When inquiring check CP 5568 on handy form, pgs. 2-3

CHEMICAL PROCESSING

NEW LITERATURE

Improved principle in pipe cutting

Pipe cutters, so constructed that cutting wheel is fed directly into pipe, are described in 4-page folder. This principle is said to allow easier, quicker cutting. Diagrams and drawings illustrate this point. Folder also includes specification on cutters.

Form 2-4 is issued by Beaver Pipe Tools, Inc., Dept. CP, Warren, Ohio. When inquiring specify CP 5569 on handy form, pages 2 and 3.

Cyclone units improved by "Jet Injection"

Cyclone thickening, classifying, clarifying, and desliming operations are said to be improved by "Jet-Injection" procedure described in four-page bulletin. With this method water is forced into unit at a definite rate and under controlled pressure. This results in a sharp and accurate classification of the slurry, according to manufacturer.

Bul. "Cyclone Thickener Equipment" is issued by Heyl & Patterson, Inc., Dept. CP, 55 Water St., Pittsburgh 22, Pa. When inquiring specify CP 5570 on handy form, pages 2 and 3.

Shows how controller has 3 actions

Printed in 2 colors, 4-page specification sheet shows the reasons behind 3-mode operation of manufacturer's pneumatic controllers. Photos and diagrams help to explain "whys" and "wherefores."

Spec sheet 771 is issued by Industrial Div., Minneapolis-Honeywell Regulator Co., Dept. CP, Wayne & Windrim Aves., Philadelphia 44, Pa. When inquiring specify CP 5571 on handy form, pages 2 and 3.

For more information on product at right, specify CP 5572 ... see information request blank between pages 2 - 3.



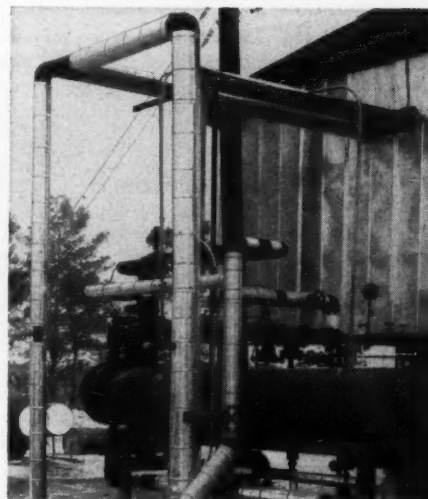
IN PETROLEUM REFINERIES like this a new kind of aluminum jacketing is used to protect the insulation on hot and cold lines. It is known as Childers Aluminum Jacketing and is especially engineered to combine the long life and weather resistance of aluminum with a low first cost. It goes on quick and easy—can be used and re-used. It is made of tough but flexible .006" 35 aluminum alloy, so it handles easily and requires no shop forming.



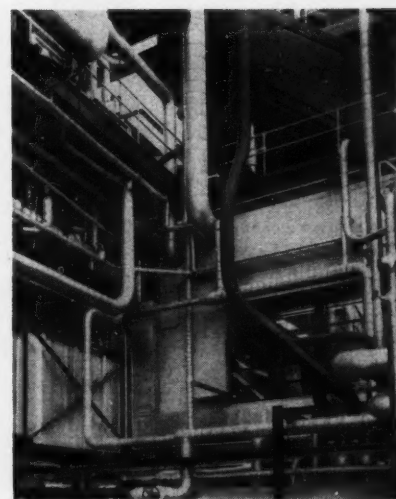
IN CHEMICAL AND PAPER plants: engineers are finding new uses for this easy-to-handle jacketing. Childers Jacketing here is in use at Scott Paper Company's tremendous Chester, Pa., plant. The insulated line passes between fast moving rolls carrying the felt used in paper making both above and below the line. The Aluminum Jacketing protects against paper dust and water, both of which are always present in the manufacture of paper. The jacketing also appreciably diminishes the possibility of the spread of fire which might strike across ordinary canvas jacketing.

Engineered for outdoor lines — new, low-cost aluminum jacketing now used in 567 processing plants

The new kind of aluminum jacketing for insulated lines shown in the pictures on this page is Childers Aluminum Weatherproof Jacketing. Write for samples and full details, no obligation. Childers Manufacturing Co., Dept. LP-6, 3620 W. 11th St., Houston 8, Texas.



IN FOOD PROCESSING plants such as this Minute Maid Corp. unit at Plymouth, Fla., Childers Jacketing is useful for both indoor and outdoor installations. Its clean, shining appearance and ease of washing are extra advantages.



IN POWER PLANTS—indoors and out—Childers Jacketing is an ideal material for protecting insulation. This is a big outdoor installation in the South. This jacketing needs no painting, and the gleaming aluminum surface makes for "good housekeeping" in any utility or institutional power station.



ALMOST ANYWHERE you have insulated lines in your processing plant, consider this specially engineered jacketing. It is flexible, easy-to-handle; yet it has the appearance values and the weather resistance that are inherent in aluminum. Write to address shown above for full details.

Advertisement

Investigate
this new
combination



BLACK DIAMOND Valve Bag Packer AND BAG SETTLER

AUTOMATIC
CONTROLLED
WEIGHT

ACCURATE
FAST
SIMPLE
CLEAN
MODERATELY
PRICED
PERFORMANCE
GUARANTEED

BLACK PRODUCTS COMPANY

13513 S. Calumet Ave., Chicago 27, Ill., Dept. P27

MANUFACTURERS SINCE 1912

For further information, write

When inquiring check CP 5573 on handy form, pgs. 2-3

Free Flowing Product

**... with Nerco-Niro
Spray Dryers***

Nerco-Niro's exclusive controlled drying method results in a uniform, easy to handle, free-flowing product.

No chamber sweepers nor other similar mechanical devices needed to remove the product from the dryer. More than 250 commercial installations in use throughout the world.

For competent, experienced advice on your spray drying problems consult a Nerco-Niro engineer. Pilot plant facilities available for test purposes. ®

* patented

NERCO-NIRO

NICHOLS ENGINEERING & RESEARCH CORP.
NERCO-NIRO SPRAY DRYER DIVISION
70 Pine Street, New York 5, N. Y.
INDIANAPOLIS PASADENA MONTREAL

When inquiring check CP 5574 on handy form, pgs. 2-3

NEW LITERATURE

Re-designed dry-type transformers described in bulletin

Transformers described in 4-page bulletin are Class B insulated 80°C rise dry-type units, in ratings 3 through 100 kva, single-phase, 600 v and below. Units are housed in ventilated steel enclosures, ratings 3 through 15 kva being suitable for indoor or outdoor service, larger ratings for indoor use only.

Re-designing of transformer line is said to have reduced size and weight of units to provide maximum ease of handling and installation.

Bul EU-106, No. 12, is available from Electrical Div., Wagner Electric Corp., Dept. CP, 6400 Plymouth Ave., St. Louis 14, Mo. When inquiring specify CP 5575 on handy form, pages 2 & 3.

Offers info on meters for maintenance

Sixteen-page bulletin contains information and illustrations of many electrical maintenance instruments. These include hook-on volt-ammeters, hook-on wattmeters, hook-on power-factor meters, portable recorders, voltmeters, and ammeters. Several other instruments are also included in bulletin.

Bul GEA-5469B is issued by General Electric Co., Dept. CP, 1 River Road, Schenectady 5, N. Y. When inquiring specify CP 5576 on handy form, pages 2 and 3.

MANAGEMENT and SAFETY

(Continued from page 5)

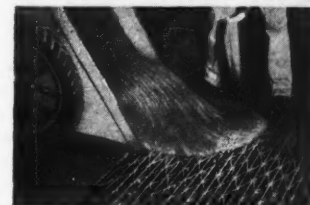
must be made to realize that such a program will help him in his work and better qualify him for promotion.

Supervisors or foremen, in their turn, are largely responsible for worker safety-training. A good foreman is always very close to the men working for him. He will give special attention to the new employee in pointing out the safe way of performing and in keeping him under constant observation until he is positively assured that the new worker is accomplishing his duties in an efficient and safe manner. It is only through close supervision and continuous carefulness by the employee that a "no accident" record can be obtained. All employees should take an active part in accident prevention work and must feel that the success of the safety program depends upon their individual efforts. The foreman's sincerity in performing his part will be reflected in the cooperation he receives from the workers.

In the final analysis, the success or failure of any safety program in any plant depends on two key figures — the plant manager and the foreman, and their main incentive must stem from the human desire to reduce suffering and help their fellow employees.

FLOORING TALK by IRVING GRATING Co., Inc.

There is an answer
to your
Flooring Problem with
IRVING GRATING!



For heavily abused areas:

CONTINUITY ARMOURING

The concrete filled grating floor will not crack or break up. Low installation cost. No upkeep problem.



For Fire Prevention and minimum weight*

ALUMINUM GRATING

The spark proof quality of Aluminum, and its High Corrosion Resistance make Irving Aluminum Grating perfect for Chemical plants.

Used for flooring or suspended catwalks,* (inside or out) it is non-skid, self-draining, ventilating and strong.

Also ask about Irving Contour Retainer Grid for Castable Refractory Materials — "GRIDSTEEL" (For use in refracting units)

**IRVING SUBWAY
GRATING CO., INC.**

ESTABLISHED 1902

OFFICES and PLANTS at
5050 27th St., Long Island City 1, N. Y.
1850 10th St., Oakland 20, California

When inquiring check CP 5577 on handy form, pgs. 2-3

CHEMICAL PROCESSING

Bulletin describes line of rigid pvc pipe

Extruded rigid polyvinyl chloride pipe and tubing in a wide range of sizes and a full line of fittings are covered in two-page bulletin. Detailed physical properties, bursting strengths, and other data are included.

Pipe and tubing are made of Alpha Forty, compounded of a vinyl chloride polymer of high molecular weight. Material is processed without the aid of plasticizers or co-polymers. It retains the excellent unmodified properties of straight pvc, resulting in an extremely hard, tough, and rigid product with outstanding chemical resistance.

Bul on Alpha Forty is issued by Alpha Plastics, Inc., Dept. CP, 14 Northfield Rd., West Orange, N. J. When inquiring specify CP 5578 on handy form, pages 2 and 3.

Kyanite recovery

Recovery of kyanite by flotation is described in bulletin. Plant produces 1 ton of final dried kyanite for every 4½ tons of feed. Engineering Notebook Bul M4-B68 is issued by Denver Equipment Company, Dept. CP, 1400 17th St., Denver 17, Colo. When inquiring specify CP 5579 on handy form, pages 2 and 3.

Shows basic unit for gas analysis

Printed in 2 colors, 4-page bulletin details basic unit used in analyzing gases by thermal conductivity. Tables, pictures, and circuit diagrams are included. Gas flow systems are shown in general principle.

Bul TC-953 is issued by Gow-Mac Instrument Co., Dept. CP, 100 Kings Road, Madison, N. J. When inquiring specify CP 5580 on handy form, pages 2 and 3.

For more information on product at right, specify CP 5581 ... see information request blank between pages 2 - 3.

Announcing Foster Wheeler's new **MOUNTAIN TOP PLANT...**

completely tooled to effectively meet your most exacting needs for steam generators, heat-transfer and process equipment!

ANTICIPATING your requirements for more efficient central station, industrial and process components, Foster Wheeler has installed in this new plant, near Wilkes-Barre, Pa., the latest, most modern equipment, such as: the 8000-ton beam press, 2 million volt x-ray facilities, the newest developments in submerged arc-welding and high-speed drilling

equipment, 83½ foot long stress-relieving furnace and others shown here.

This modern equipment, the plant's proximity to steel supplies, and its strategic location for direct rail shipment to all areas, assure you of fast, economical, high-quality fabrication to meet your specifications for the largest, heaviest drums and pressure vessels.

1. 8000-TON BEAM PRESS
Hydraulically operated, will bend steel plates 40' long, 8" thick.

2. PLATE EDGE PLANER
Will take the longest available plates, for cutting welding grooves.

3. OVERHEAD CRANES
Four large cranes capable of lifting the heaviest and largest equipment easily.

4. DOUBLE HOUSING PLANER
Highest speed planing.

5. AUTOMATIC WELDING MACHINES
Submerged-arc, automatic flux recovery-type, mounted on track.

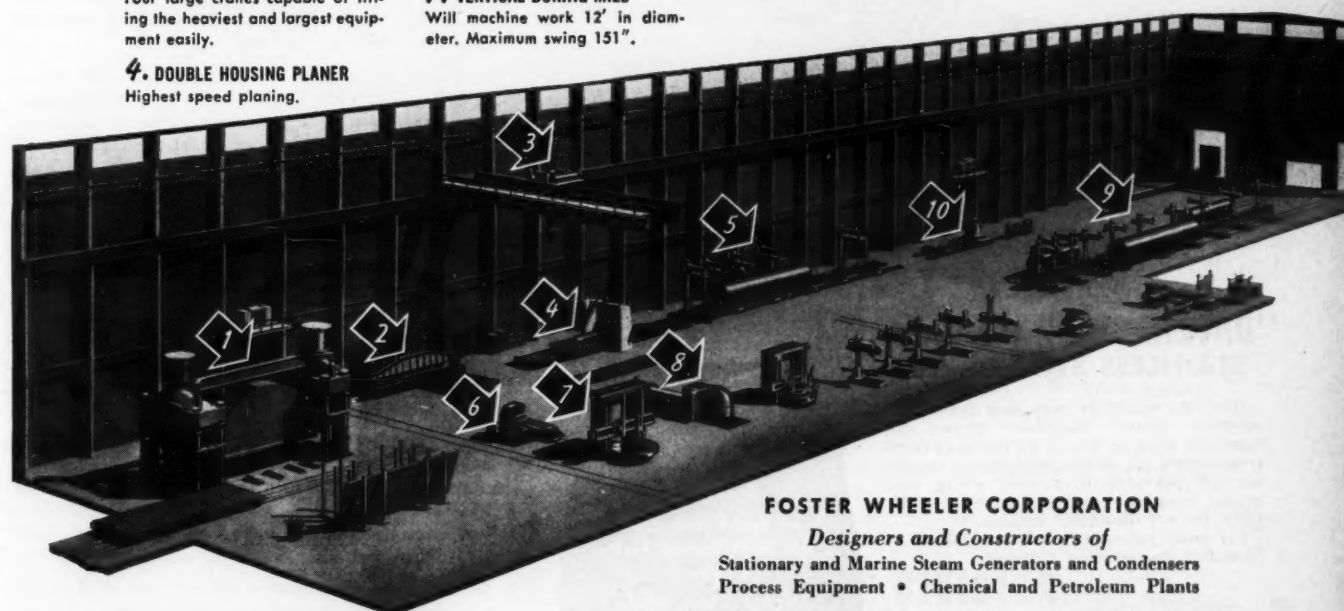
6. 500-TON CRIMPING PRESS
For cold-bending edge of plate preparatory to rolling.

7. VERTICAL BORING MILL
Will machine work 12' in diameter. Maximum swing 151".

8. BENDING ROLLS — PINCH TYPE
By hot or cold rolling will form cylinders for medium-pressure vessels.

9. HIGHEST SPEED DRILLS — RADIAL TYPE
These are mounted on ways and tracks, power positioned.

10. DRUM FACING MACHINE
Quick preparation of ends of cylinder for assembly with heads.



Artist's sketch of the main bay of the new Mountain Top, Pa. plant. 800' long, 90' wide, 75' high.

FOSTER WHEELER CORPORATION

Designers and Constructors of
Stationary and Marine Steam Generators and Condensers
Process Equipment • Chemical and Petroleum Plants

NEW YORK • LONDON • PARIS • ST. CATHERINES, ONTARIO

FOSTER  WHEELER

Automatic Valve Operation With No Electrical Power!

NEW!

ASCO®

Pressure Operated Manual Reset Valves

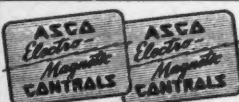
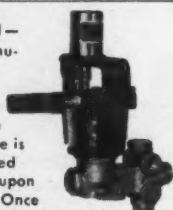
Reduce Hazards! Provide Reliable Operation!

MOVEMENT	PIPE SIZES (Inches)	Maximum PRESSURES (lbs./sq. in.)
2 Way*	3/8-6	600
3 Way	1/4-1/2	300
4 Way	1/4-3/4	250

*Normally open or normally closed

OPERATION —

Valve is manually set and remains in operating position until pressure is lost or applied (depending upon Valve type). Once tripped, the Valve must be manually reset.

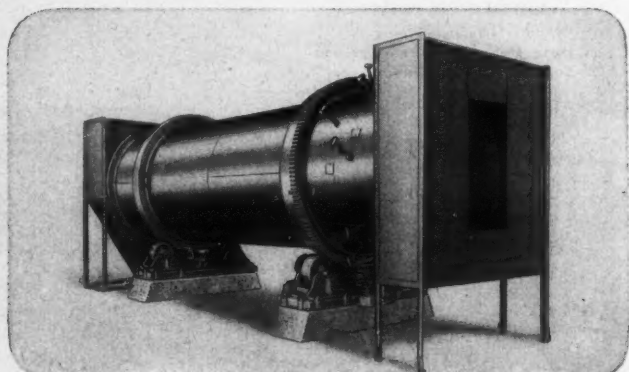


Automatic Switch Co.

379 LAKESIDE AVENUE • ORANGE, NEW JERSEY

Write for Free Literature!

When inquiring check CP 5582 on handy form, pgs. 2-3



"DAVENPORT" HOT AIR STAINLESS STEEL DRYER

Used on materials requiring close temperature control. Illustration shows the type unit used for drying cereal by-product with heated air. Notice self-cocking knockers are provided to prevent sticky materials from adhering to inside of shell. Write for our illustrated catalog.

For quick reference see your 1953 or '54 Chemical Engineering Catalog.

DAVENPORT MACHINE AND
Foundry Company
DAVENPORT IOWA

When inquiring check CP 5583 on handy form, pgs. 2-3

DAVENPORT

De-Watering
Presses and
Screens
ROTARY
Steam Tube, Hot
Air and Direct Fire
Dryers
Water Tube and
Air Coolers

NEW LITERATURE

Panelgraphs, components in industry

Four-page bulletin pictures graphic panels at work in oil refineries, chemical plants, process industry installations. It explains various graphic symbolism techniques and shows typical components. Bul PI-153 is issued by Panellit Inc., Dept. CP, 6312 N. Broadway, Chicago 40, Ill. When inquiring specify CP 5584, pages 2 and 3.

MELAMINE

(Continued from page 7)

The plant, which has been enlarged repeatedly, produces numerous plastics and resins from melamine and now employs more than 600 people.

Work on the second problem — new melamine-formaldehyde products — resulted in more than 100 patents. These deal especially with combinations of melamine and formaldehyde. Now resins discovered along the way brought plenty of new process problems of their own. Among the improved products was one worked out by Paul Schory. Mineral filled, it was fire resistant and became very important in military design. Dr. L. P. Moore (now Assistant General Manager of the Company's Plastics and Resins Division) headed a research team that developed the first surface coating formulations containing melamine resins. Dr. H. P. Wohnsiedler and Mr. W. M. Thomas at the company's Stamford Research Laboratories came up with electrically charged resins which Messrs. Landes and Maxwell demonstrated could be used in giving wet strength to paper by the simple expedient of incorporating them with the paper fiber in the beater.

President Towe says of this period, "For several years . . . every time I went to a budget meeting somebody was asking for more money for melamine development . . . [but] we've never regretted the fact that we were generous."

But even the tremendous programs of research undertaken during the war have paled at work which has been done since. Forms of the material have found their way into electrical and ignition parts, adhesives for aircraft and marine plywood, paper treating resins, tanning agents for white leather, textile treating resins . . . and more uses are still appearing. One line of "specialties" — melamine (Melmac®) dishes — has grown from nothing in 1945 to an outlet for millions of pounds per year of molding compound.

It was Palmer Griffith's friend, C. J. Romieux, now Sales Manager of Cyanamid's Plastics & Resins Division, who called the turn. Though he was associated with sales and customer service, "Charlie" Romieux was a chemist himself and from the first had argued the virtues and potential of the new material.

Even today, with melamine in firm control of a number of markets, research and development is intense. The products of past labor are being used every day — and still the team that made them possible is working on further innovations, looking at old, old problems from new viewpoints.

THREADED SPECIALTIES

EYE BOLTS

by an
exclusive method



Among Pawtucket's many specialty products, these lower-cost eye bolts or "swing" bolts are the leaders in this field. Pawtucket's exclusive production method keeps cost low, dimensional accuracy unusually high and strength above standard.

Pawtucket eye bolts are made in standard sizes 1/2" and larger, or to your specifications. In any size, you can depend on a uniform Class 3 fit.

BETTER BOLTS SINCE 1882

PAWTUCKET

THE BOLT MAN
MANUFACTURING COMPANY
327 Pine Street Pawtucket, R. I.
THE PLACE TO SOLVE YOUR BOLT PROBLEM

When inquiring check CP 5585
on handy form, pgs. 2-3

CHEMICAL PROCESSING

Tabulates Teflon products

Extensive line of Teflon products are described and illustrated in 8-page catalog. Stress relieved as well as high tensile molded rods, tubes and sheets; extruded rod and tubing; electronized rod; custom moldings; machined parts; shaved tape and other products are presented. Techniques for machining Teflon are described and engineering services are offered. Teflon applications and properties are listed with charts, tables and diagrams.

Cat "Teflon by Ethylene" is available from Ethylene Chemical Corp., Dept. CP, Summit, N. J. When inquiring specify CP 5586 pgs. 2 and 3.

Information on motor driven controlled volume pumps

This 40-page bulletin contains valuable information on manufacturer's line of motor driven controlled volume pumps. Other technical data includes capacity-pressure selection tables; types of capacity adjustments; standard and special designs, as well as packaged systems. A two-page chart describes typical applications in six major industries. Also included is a four-page materials selection chart in four colors, provided as a guide for chemists and engineers.

Bul 553 is available from Station "C", Milton Roy Co., Dept. CP, 1300 E. Mermaid Lane, Chestnut Hill, Philadelphia 18, Pa. When inquiring specify CP 5587 on handy form, pages 2 and 3.

Tells construction and uses of multiple liquid cyclone

Ten-page, 2-color bulletin pictures and describes multiple-unit type liquid cyclone, shows advantages, and discusses applications. Sectional elevation drawings and pictures of unit and its components are included. Actual operating data from initial tests and installations are presented.

Bul 2502 is issued by The Dorr Company, Dept. CP, Barry Place, Stamford, Conn. When inquiring specify CP 5588 on handy form, pages 2 & 3.

Deals with demineralizers for water treatment

Construction and performance specifications are included in illustrated bulletin which presents full line of mixed-bed, 2-bed and 4-bed water demineralizers. Special features are emphasized, such as indicator which shows when exchange capacity of resins is exhausted.

Bul 126 is available from Barnstead Still & Sterilizer Co., Dept. CP, 239 Lanesville Terrace, Forest Hills, Boston 31, Mass. When inquiring specify CP 5589 on handy form, pages 2 and 3.

THE GREATEST SHOWING OF INDUSTRIAL RUBBER PRODUCTS ON EARTH

1. Special heat-resistant cover compound, firmly bonded to carcass.
2. Non-charring asbestos cords interbraided with wires which dissipate static electricity.
3. High adhesion between plies provided by special insulative compound.
4. Steel wires of high-tensile strength braided to resist high steam pressures and make hose Burst-Proof.
5. Heat- and oil-resisting inner tube retains resiliency under high-pressure steam.

SAFETY IS YOUR CONCERN!

Your employees rightfully expect you to furnish them with the Safest tools available . . . including Steam Hose that Will Not Burst!

WIRETEX Steam Hose will not burst . . . can not suddenly spray out super-heated steam, blinding steam, maiming steam; yes, even killing steam.

For what you are now paying for ordinary steam hose, you can insist upon getting WIRETEX Steam Hose . . . with a Safety Factor far beyond that provided by ordinary steam hose specifications.

Ask your local Republic Rubber Distributor. If his name is not listed in the yellow pages of your telephone directory, write directly to us.

**REPUBLIC RUBBER DIVISION**

LEE RUBBER & TIRE CORPORATION, YOUNGSTOWN 1, OHIO

INDUSTRIAL RUBBER PRODUCTS

When inquiring check CP 5590 on handy form, pgs. 2-3



Seasons Greetings

We take time out to express our thanks and good wishes to all

MERRY CHRISTMAS and a HAPPY NEW YEAR

CATAWISSA VALVE & FITTINGS CO.
CATAWISSA • PENNSYLVANIA



RICHMOND super-sifter

**"... doing a better job ..."
in a Wood Flour Mill**

Mr. James B. Stamps, Vice-President, Allen-Rogers Corporation (turned wood products) recently wrote:

"Our new flour mill has been in operation for something over a year now, and we have had an opportunity to observe closely the results which we are obtaining from the sifter, magnets, and stream splitter which we purchased from your company.

"We are very happy to tell you that in all cases these are performing satisfactorily and are indeed doing a better job than any other similar devices which we have used in the past."

Perhaps your plant can profit from the use of RICHMOND SIFTERS, too.

RICHMOND MANUFACTURING COMPANY
AFFILIATED WITH NOVADOL-AGENE CORP.
LOCKPORT, NEW YORK

When inquiring check CP 5591 on handy form, pgs. 2-3

NEW LITERATURE

Delves into theory of rotameters

Illustrated 2-color 16-page catalog discusses rotameter theory. It presents objective comparisons between variable-area types and the more common variable head type measuring elements such as orifices, Venturis, etc. Basic flow equation and information on calibration scales, metering range, permanent pressure loss, upstream piping effects, viscosity effects, and many others are discussed.

Cat 10-A-10 is issued by Fischer & Porter Co., Dept. CP, 6 County Line Rd., Hatboro, Pa. When inquiring specify CP 5592 on handy form, pages 2 and 3.

Quick Identification of Industrial tapes

Tape number dictionary gives quick, easy identification of industrial pressure sensitive tapes. Information on hundreds of tapes has been gathered and reproduced in this convenient, pocket-size booklet.

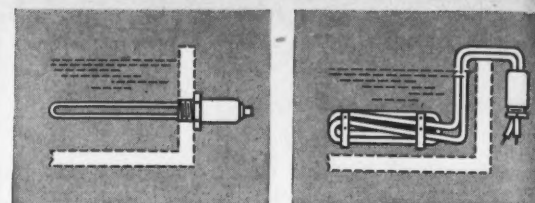
Each tape number is listed in sequence with the manufacturer's name. For each tape there is included a description of its construction. Booklet is designed as an aid in determining the right tape for a specific application.

To obtain booklet P3-4 remit 25c direct to Polyken Industrial Tape, Dept. of Bauer & Black, Div. of the Kendall Co., Dept. CP, 222 W. Adams St., Chicago 6, Ill.

Dial thermometers for all uses

Sixteen-page bulletin is printed in 2 colors. It describes dial thermometers for long-distance measurement. Variety of ranges, bulbs, tubing, and accessories are emphasized.

Bulletin 467 is issued by The Foxboro Co., Dept. CP, Foxboro, Mass. When inquiring specify CP 5593 on handy form, pages 2 and 3.



Heat liquids fast, efficiently with Calrod* immersion heaters

Applicable to nearly any liquid heating job, long-life G-E "screw-in" and "over-the-side" Calrod immersion heaters give you this top performance:

Efficiency—heaters are right in liquid, for maximum heat transfer.

Cleanliness—no open flame to cause smoke and fumes, create fire hazards.

Uniformity—adaptable to thermostatic control for precise temperature regulation.

For more information, see your G-E Apparatus Representative or Distributor. And write now for—

FREE APPLICATION BULLETINS

GEA-5077—"Heating Liquids with Electric Heaters"
GEA-5545—"Calrod Heater Selector Guide"

Sect. 720-112, General Electric Co., Schenectady 5, New York.

*Reg. Trade-mark of General Electric Co.

GENERAL ELECTRIC

When inquiring check CP 5594 on handy form, pgs. 2-3

FREE! New Safety Information Process Engineers Need!



IF YOU BURN oil, gas, powdered coal or other fuel, for power, processing or heating, the chances are 4-out-of-5 that you do not have complete safeguards against burner flame-failure explosions.

Why take chances . . . ? This new booklet gives you all the information you need to prevent

flame-failure explosions. With it you can spot burner explosion hazards in your plant — identify obsolete or inadequate "protective" devices — determine your needs for the most modern safeguard equipment. Get your copy, free! Please give your company name and title.

WRITE:

COMBUSTION CONTROL CORPORATION
Dept. MB-12, 718 Beacon Street
Boston 15, Mass.



When inquiring check CP 5595 on handy form, pgs. 2-3

NEW LITERATURE

Uses and features of "Z" calender

Manufacturer's "Z" calender is discussed in 4-page illustrated bulletin. Literature briefly covers applications and design features. Bul 197 is issued by Farrel-Birmingham Company, Inc., Dept. CP, Ansonia, Conn. Inquiring specify CP 5596 on handy form, pages 2 and 3.

Elimination of rust by galvanizing

Sixteen-page illustrated booklet describes how rusting can be prevented by hot dip galvanizing. Highlighting the book are sections showing the use of method in varying applications. Details of quality controls necessary are given. A description of the actual process is followed by a check chart on coatings. Microscopic photograph helps to point out the advantages of hot dip galvanizing.

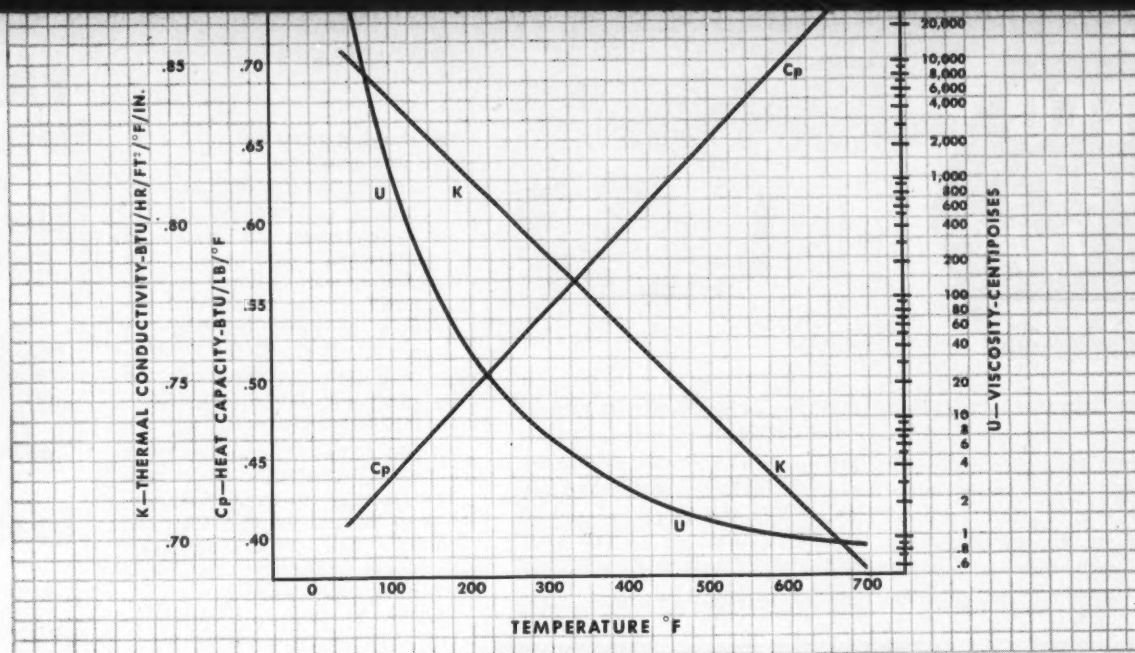
Booklet, "Stop Rust Once and For All" is issued by American Hot Dip Galvanizers Ass'n, Inc., Dept. CP, 1506 L, First National Bank Bldg., Pittsburgh 22, Pa. When inquiring specify CP 5597 on handy form, pages 2 and 3.

Info on high-temp alloy fastenings

Pertinent, non-technical information about high-temperature alloys and their uses as fastenings is featured in 8-page bulletin. Included is a descriptive article on the process known as "Cold Heading." Data are also presented on applications of company's corrosion-resistant fastenings.

"Bolt News" Vol 18, No. 2, is issued by The H. M. Harper Co., Dept. CP, 8251 Lehigh Ave., Morton Grove, Ill. When inquiring specify CP 5598 on handy form, pages 2 and 3.

For more information on product at right, specify CP 5599 ... see information request blank between pages 2 - 3.



Thermal properties of Circo XXX Heavy Heat Transfer Oil are indicated as follows: thermal conductivity (K); heat capacity (Cp); viscosity (U).

WHY IS CIRCO XXX HEAVY AN EXCELLENT HEAT TRANSFER MEDIUM for temperatures as high as 600 F?

because:

- 1 Its high thermal conductivity assures fast, efficient heat transfer to the process material
- 2 Its high heat-carrying capacity assures maximum efficiency over its entire operating temperature range
- 3 It doesn't form hard carbon deposits, which reduce heat transfer efficiency
- 4 Its low vapor pressure and high initial boiling point prevent pressure buildup
- 5 Its viscosity is low enough to permit easy circulation with any pump used in an oil-type heat transfer system

Other important properties of Circo XXX Heavy Heat Transfer Oil

Viscosity, SUS at 210 F . . . 145-155
Gravity, Specific 0.94-0.96
Acidity neutral
Carbon residue 0.5 max
Demulsibility good
Initial boiling point . . . approx 860 F
Vapor pressure at 600 F nil

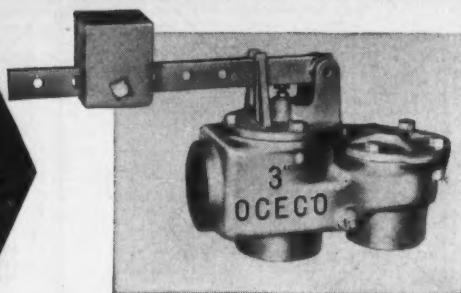
For more information about heat transfer oils and systems, send for "Circo Heat Transfer Oils." Write SUN OIL COMPANY, Philadelphia 3, Pa., Department CP-12.

INDUSTRIAL PRODUCTS DEPARTMENT
SUN OIL COMPANY



PHILADELPHIA 3, PA. ♦ SUN OIL COMPANY LTD., TORONTO & MONTREAL

OCECO V-109 Still Type VALVES



● These valves combine both vacuum relief and pressure relief in a single body and avoid the necessity of using two separate valves when both vacuum relief and pressure relief are desired. 3 inch, 4 inch and 6 inch sizes. Steel bodies. Bronze, stainless steel or aluminum

trim. Can be furnished with vacuum relief settings from 1 oz. to 10 oz. per square inch. Pressure relief settings from 2 lbs. to 25 lbs. per square inch. For temperatures up to 650° F.—working pressures up to 30 lbs. per square inch. Write for fully descriptive data sheet.

OCECO TANK FITTINGS

THE JOHNSTON & JENNINGS CO.

division of PETTIBONE MULLIKEN CORP.

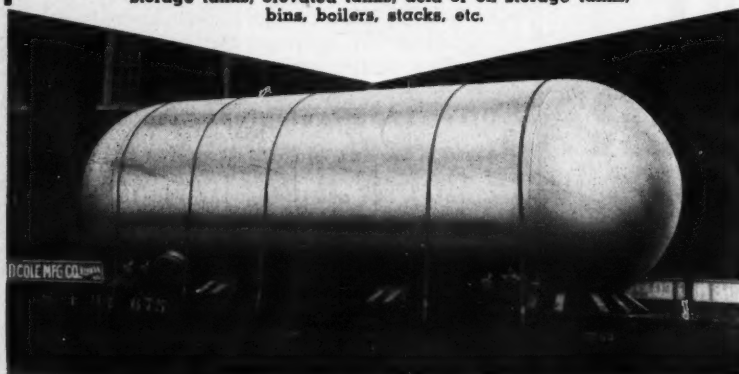
4751 West Division St.

Chicago 51, Illinois

When inquiring check CP 5600 on handy form, pgs. 2-3

COLE ALUMINUM TANKS

We have available stock sizes from 9,500 to 22,900 gallons for pressure storage, and tanks of 99.6% pure aluminum for hydrogen peroxide from 5,000 to 11,150 gallons. "Cole" can furnish tanks made of steel, aluminum and stainless steel — built in accordance with ASME Code — to meet all insurance requirements. We invite your inquiries for high pressure storage tanks, elevated tanks, acid or oil storage tanks, bins, boilers, stacks, etc.



R. D. COLE MFG. CO.

NEWNAN, GA. Established 1854



TANKS • TOWERS • CYLINDERS • VESSELS

When inquiring check CP 5601 on handy form, pgs. 2-3

NEW LITERATURE

Packaging costs cut by box machine

Compact and flexible box machine is one-man-operated and accommodates all grades of corrugated board up to 350 lb double wall. Boxes can be made at rate of 400-600 per hour, in size ranges from 7 x 4 x 2" to 36 x 18 x 32". Applications, specifications, and production data are outlined in 6-page bulletin.

Bul "Lower Your Packaging Costs" is available from Colt's Mfg. Co., Packaging Machinery Div., Dept. CP, Hartford 15, Conn. When inquiring specify CP 5602 on handy form, pages 2 and 3.

Tells concise story on packaged boilers

Clear, concise story, with illustrations, on "how's" and "why's" of manufacturer's packaged steam boiler for oil or combination oil and gas firing is presented in 4-page bulletin.

General specifications and standard and special construction details are included. Standard boilers are built to ASME specification for maximum allowable pressures of 100 lb.

Bul 7D is issued by Mears-Kane-Ofeldt, Inc., Div. of S. T. Johnson Co., Dept. CP, Church Rd., Bridgeport, Pa. When inquiring specify CP 5603 on handy form, pages 2 and 3.

Tile tanks and linings covered in bulletin

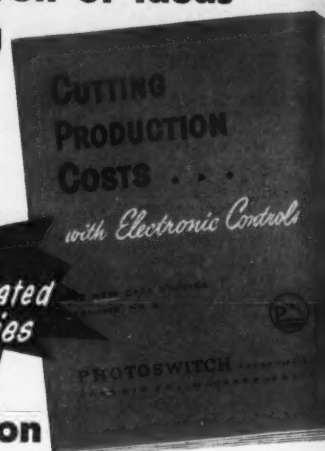
Variety of tile tanks and linings available from company are described in four-page bulletin. Eight different types of tile or brick are described, as well as membrane linings which can be furnished. Photographs illustrate typical applications, which include installations to resist many different kinds of corrosives. Company specializes in design, installation, maintenance, and repair of corrosion-resistant linings and tile tanks.

Bul A-153 is issued by Stebbins Engineering and Mfg. Co.,

FREE! Full of ideas for saving with Electronic Controls

45 new illustrated case studies

1953 Edition



A completely revised edition of the handbook that has become the "bible" of electronic control for thousands of engineers and production executives.

Newly edited, with 45 new case studies showing how standard packaged electronic controls have solved many industrial problems you're likely to meet. It explains clearly and factually, without hocus-pocus, tested ideas for achieving new efficiency through "Electron-eered" counting, weighing, measuring, timing and cycling.

SEND FOR YOUR COPY NOW!

PHOTOSWITCH INC.

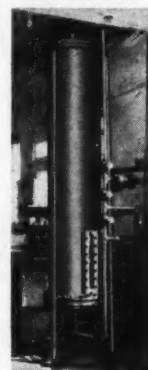
Dept. CA-12, 77 Broadway, Cambridge 42, Mass.



When inquiring check CP 5604 on handy form, pgs. 2-3

Barnstead

Mixed Bed Demineralizers



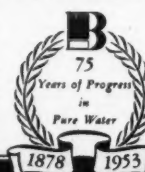
10 to 2500 Gallons or more per Hour

Sturdy construction and simplified design, plus a new, improved regeneration system make Barnstead Mixed Bed Demineralizers outstanding in performance.

Easy to operate — easy to regenerate — they produce ion-free water at very low cost, and you get more gallons between regenerations.

Each unit complete with regenerant tanks, flow meter, pressure gage, purity indicator, and simplified regeneration. Steel columns lined with heavy sheet rubber.

WRITE FOR NEW BULLETIN #126 on Mixed Bed Demineralizers



In 3 years of operation, this 500 gph Barnstead Demineralizer has produced over 4 million gals. of high purity demineralized water with a minimum of maintenance or attention.

66 LANESVILLE TERRACE



FOREST HILLS BOSTON 31 MASS.

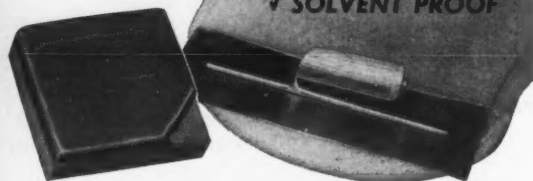
When inquiring check CP 5605 on handy form, pgs. 2-3

CHEMICAL PROCESSING

Ceilcrete

**a stonelike corrosion proof
trowelled on surface**

✓ ACID PROOF
✓ ALKALI PROOF
✓ SOLVENT PROOF



**TOPPING for FLOORS • WALLS
ACID HOLDING TANKS • WASTE
DISPOSAL SYSTEMS, ETC.**

THE CEILCOTE COMPANY
4832 Ridge Road, Cleveland 9, Ohio



**Send for technical data
on its application, corrosion
resistance properties**

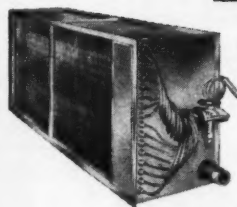
When inquiring check CP 5606 on handy form, pgs. 2-3

**Industry Had
Acid Vapor
Heating and
Cooling Problems**

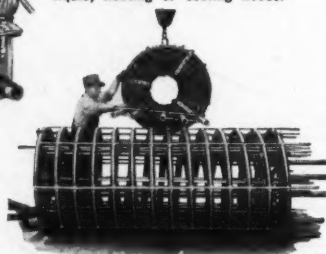
REMPE

Solved Them With...

**FIN AND PIPE COILS
OF STAINLESS STEEL**



Rempe Fin Type Coils are ideally suited for handling all types of corrosive air mixtures, gas or liquid, heating or cooling needs.



We have complete facilities and tested technique in the fabrication, welding and finishing of pipe coils made from all types of stainless steel.

Send details or blueprints for engineering advice and quotations on your requirements, for all types, all materials of pipe and fin coils.

REMPE COMPANY

330 N. SACRAMENTO BLVD. CHICAGO 12, ILL.

When inquiring check CP 5607 on handy form, pgs. 2-3

DECEMBER, 1953

NEW LITERATURE

Dept. CP, Watertown, N. Y.
When inquiring specify CP 5608 on handy form, pages 2 and 3.

Corrosion Inhibitors covered in booklet

Corrosion inhibitors that are effective in low concentrations and over wide ranges are described in detail in eight-page booklet. They can be used in pickling formulations, oil well acidizing, gas condensate corrosion control, acid cleaning and derusting, and for boiler scale removal. They reduce corrosion caused by sulfuric, hydrochloric, hydrofluoric, and phosphoric acids, as well as oxalic and other organic acids.

Report 53-3 is issued by Sharples Chemicals Inc., Dept. CP, 123 South Broad St., Philadelphia 9, Pa. . . . When inquiring specify CP 5609 on handy form, pages 2 and 3.

Problems solved by beryllium copper

Design problems solved by beryllium copper are illustrated in booklet. Properties of material are discussed, and applications in a number of industries are presented.

Booklet, "Applications Unlimited", is issued by The Beryllium Corp., Dept. CP, Reading, Pa. When inquiring specify CP 5610 on handy form, pages 2 and 3.

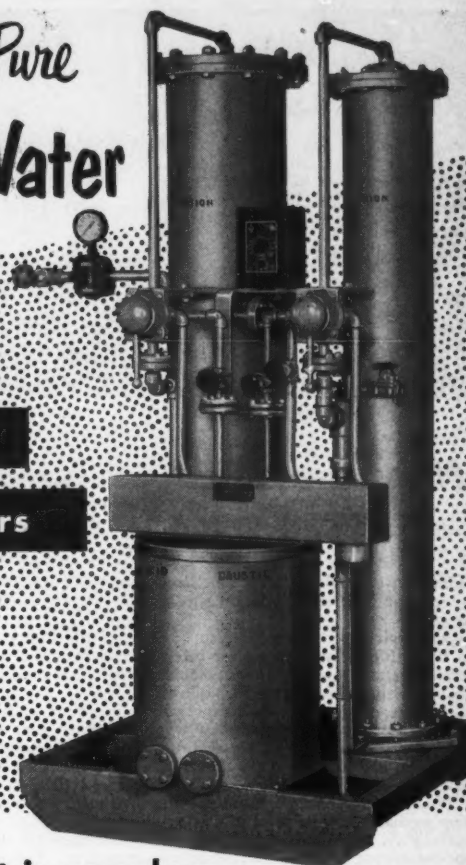
Provides instrument data on weighing system

Illustrated 4-page data sheet describes in detail instrument weighing system using electronic equipment. Components and circuit are shown, characteristics are tabulated. Data sheet 10.18-4 is issued by Industrial Division, Minneapolis-Honeywell Regulator Co., Dept. CP, Wayne & Windrim Avenues, Philadelphia 44, Pa. When inquiring specify CP 5611 on handy form, pages 2 and 3.

Chemically Pure Process Water

INDUSTRIAL

Demineralizers



and the cost is very low...

With an INDUSTRIAL demineralizer chemically pure water, in any quantity, runs as low as a few cents per thousand gallons, depending upon the amount of dissolved solids in the raw supply water. And the equipment required is very simple — no heat, steam, or cooling water is used. Units can be made to deliver almost any quantity of purified water. The operation is practically automatic — only limited attention is needed periodically.

INDUSTRIAL demineralizers are supplied with necessary equipment including resins, pressure gauge, flowmeter, purity indicator, control valves, and with vulcanized rubber lining in columns and regenerant tanks.

Standard INDUSTRIAL demineralizer units have capacities up to 1000 gph. Special units of any capacity are engineered to special requirements of quality or quantity

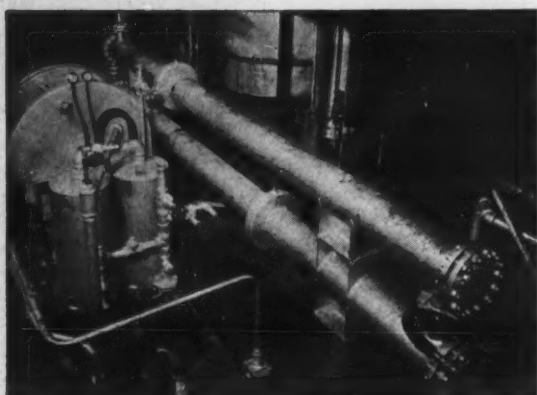
**Full particulars and recommendations
for any job will be given upon request.**

**INDUSTRIAL
FILTER & PUMP MFG. CO.**

5908 Ogden Avenue, Chicago 50, Illinois

PRESSURE FILTERS
DEMINERALIZERS
RUBBER LININGS

When inquiring check CP 5612 on handy form, pgs. 2-3



When are 2 heat exchangers BETTER THAN ONE?

Here's an example of how Pfaudler engineering know-how can solve your heat exchanger problems at the lowest possible cost to you.

A chemical processor came to us for a single heat exchanger to do a single duty. But after careful analysis of the customers requirements, our engineers recommended the *two* heat exchangers shown in the picture above. Why?

Because of the unusual temperature conditions under which this customer was processing, it was determined that two heat exchangers connected in series, instead of one, would do the job more efficiently — and therefore more economically. More than a year of actual operation has proved this to be true.

Pfaudler also offers a complete line of standard stainless steel heat exchangers. Because of our extensive stocking of standard parts, even the standard Pfaudler heat exchangers can generally be engineered to your individual requirements. Yet they cost you no more than standard units. And new production methods make possible 4 to 12 week deliveries.

Whenever you have an engineering problem involving heat exchange, we will be glad to discuss it with you — without obligation. And the chances are that Pfaudler can solve it in the least time and at the lowest possible cost to you.



ALL THE DATA YOU NEED to work out heat exchanger capacity and type problems is contained in this 40-page, fact-packed Pfaudler manual. The tables, charts and curves are easy to follow. And it includes full details on Pfaudler heat exchangers. Mail the coupon for your copy.

Pfaudler

Engineers and fabricators of corrosion resistant process equipment since 1884

GLASSED STEEL • HASTELLOY • ALUMINUM • CARBON STEEL • SOLID OR CLAD STAINLESS STEEL • NICKEL INCONEL • MONEL

THE PFAUDLER CO., Dept. CP-12, Rochester 3, N. Y.

Please send me the Pfaudler Heat Exchanger Manual No. 837

Name

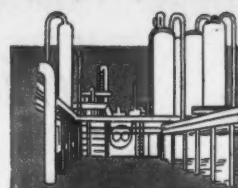
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Company

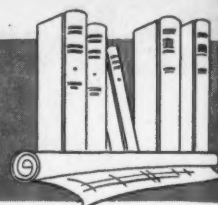
Address

City Zone State

When inquiring check CP 5613 on handy form, pgs. 2-3



Processing and Engineering Data

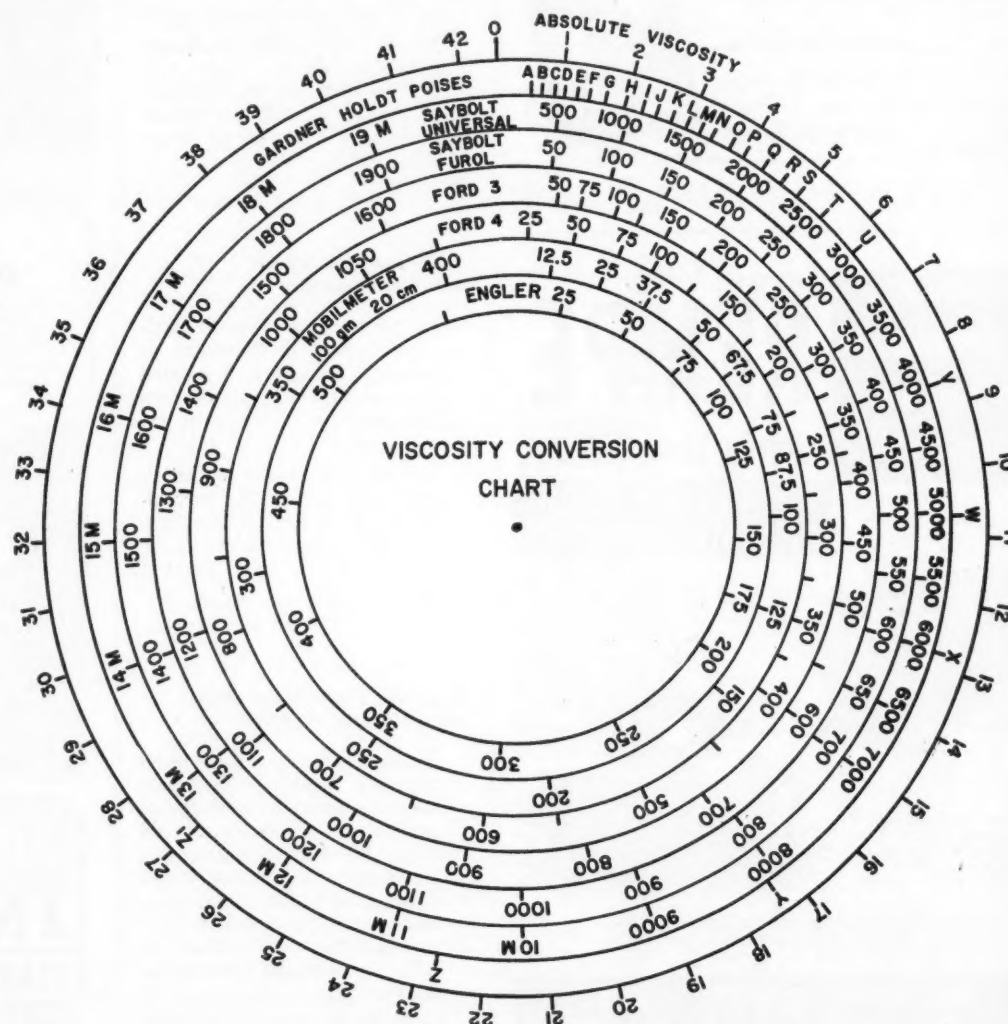


QUICK VISCOSITY CONVERSION

Courtesy of PALO LABORATORY SUPPLIES, Inc.

This novel conversion nomograph shows viscosity in any of eight standard units. In order to convert from one set of units to another, a straightedge is placed so that it passes through known viscosity and

through the chart's center. Straightedge will then intersect other equivalent readings of viscosity. Chart is intended for use in rapid estimation rather than extreme accuracy.



Chemical Processing — December, 1953

How microwave radio nets control pipelines

Radio signals at 2000 megacycles are employed in controlling pipelines. Recently published booklet explains details of these radio systems including practical considerations like maintenance, standby equipment and other facets. Booklet B-5851 is issued by Westinghouse Electric Corp., Dept. CP, Box 2099, Pittsburgh 30, Pa. When inquiring specify CP 5614 on handy form, pages 2 and 3.

Presents electrical wires & cables for chemical industry

Seventy-six-page booklet presents electrical wires and cable for the chemical and petroleum industries. Booklet is divided into 4 main sections: insulation compounds; jacket compounds; constructions; and technical data.

Compound sections have been expanded to include butyl insulation, heat- and moisture-resistant insulations, thermoplastic types, general-purpose Neoprene jacket, and the polyvinyl chloride type jacket.

Bul "U.S. Electrical Wires and Cables for the Chemical and Petroleum Industries" is available from Electrical Wire and Cable Dept., United States Rubber Co., Dept. CP, 1230 Avenue of the Americas, New York 20, N. Y. When inquiring specify CP 5615 on handy form, pages 2 and 3.

Scientific dictionary available

Reference volume embraces all of the more widely used terms in chemical processing industries. These include such fields as plastics, paints, soaps, detergents, ceramics, insecticides, textiles, adhesives, industrial chemicals, fungicides, packaging materials, and petroleum.

Stewart's Scientific Dictionary is available by remitting \$10.50 direct to Gardner Laboratory, Inc., Dept. CP, 4723 Elm St., Bethesda 14, Md.

Outlines pertinent details of arc welding

Designed to help fabricators of tubular materials, reference table outlines pertinent details to be observed in joining similar and dissimilar alloys by arc welding. It covers carbon, intermediate chromium alloy steels, and stainless steels; outlines electrodes to be used and suggests preheating and postwelding heat treatments to be employed in obtaining satisfactory results.

Technical Data Card 155 is available from Tubular Products Div., The Babcock & Wilcox Co., Dept. CP, Beaver Falls, Pa. When inquiring specify CP 5616 on handy form, pages 2 and 3.

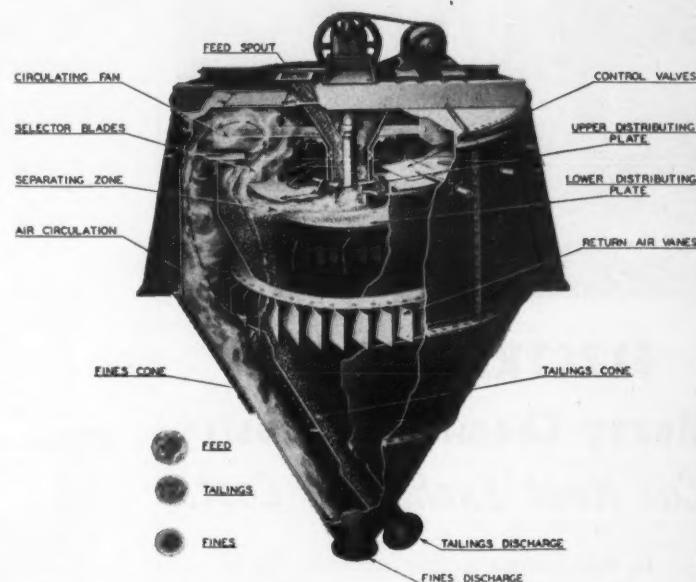
Increase Your Output up to 300%...

Get Accurate Fines with...

STURTEVANT Whirlwind Centrifugal SEPARATORS

The Sturtevant Air Separator is one investment that pays off daily profits by increasing production and reducing costs. Its extremely efficient operation assures finer separation of fine material from coarse material with the result that uniform quality of product is always obtained.

They'll not only increase your output by as much as 300%, but provide 10 to 50% savings in power costs, too. They are available in sizes 3 to 16 feet in diameter with capacities from ¼ to 50 tons per hour with a fine-product range of 40 to 325 mesh or finer. Bulletin 087 gives the entire story. Write for your copy.

**Other Sturtevant Equipment for Increasing Production and Cutting Costs****MICRONIZER® GRINDING MACHINE**

A fluid jet grinding machine, the Sturtevant Micronizer speeds reduction of materials to low micron sizes. These jet mills are especially applicable in fields where a particle size in microns is desired.

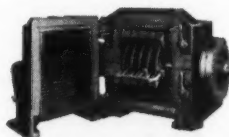
Sturtevant Micronizer grinding machines are available in many sizes and capacities.

**ROTARY FINE CRUSHERS**

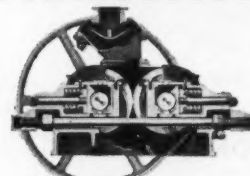
for intermediate and fine reduction (1" to ¼"). Open door accessibility. Soft or moderately hard materials. Efficient granulators. Excellent preliminary Crushers preceding Pulverizers.

**RING-ROLL MILLS**

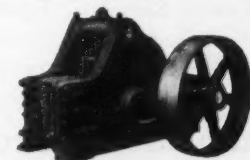
for medium and fine reduction (10 to 200 mesh), hard or soft materials. Very durable, small power. Operate in closed circuit with Screen or Air Separator. Open door accessibility. Many sizes. No scrapers, plows, pushers, or shields.

**SWING-SLEDGE MILLS**

for coarse and medium reduction (1" to 20 mesh). Open door accessibility. Soft, moderately hard, tough or fibrous substances. Built in several types and many sizes.

**CRUSHING ROLLS**

for granulation, coarse or fine, hard or soft materials. Automatic adjustments. Crushing shocks balanced. For dry or wet reduction. Sizes 8x5 to 36x20. The standard for abrasives.

**JAW CRUSHERS**

for coarse, intermediate and fine reduction of hard or soft substances. Heavy or light duty. Cam and Roller action. Special crushers for Ferroalloys. Several types, many sizes.

STURTEVANT MILL COMPANY

119 CLAYTON STREET, BOSTON 22, MASSACHUSETTS

DESIGNERS & MANUFACTURERS OF CRUSHERS • GRINDERS • SEPARATORS • CONVEYORS • MECHANICAL DENS AND EXCAVATORS • ELEVATORS • MIXERS

When inquiring check CP 5617 on handy form, pgs. 2-3



ELECTRUNITE helps Heavy Chemicals Industry Cut Heat Exchanger Costs

In this ferrous sulfate recovery plant, for example, evaporators, calandrias, dryers, and crystallizers are tubed with ELECTRUNITE Heat Exchanger Tubes. In fact, throughout the chemical industries, ELECTRUNITE Pressure Tubes help keep dozens of processes on-stream.

ELECTRUNITE Heat Exchanger and Condenser Tubes are uniform in ductility and corrosion resistance all-around and end-to-end. Full-normalizing assures clean scale-free surfaces. Bending is smooth, even to short radii.

Whether you're interested in new equipment or retubing, it will pay you to specify Republic ELECTRUNITE Heat Exchanger Tubes, carbon or stainless. For further information, write for Booklet SPI-53.

REPUBLIC STEEL CORPORATION
STEEL AND TUBES DIVISION
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When inquiring check CP 5618 on handy form, pgs. 2-3



A New Equation for S-Shaped Curves

By D. S. DAVIS

Professor of Chemical Engineering
Virginia Polytechnic Institute

In many instances, chemical engineering data, when plotted, result in curves that resemble an elongated "S". Since the elongated "S" consists of two definitely curved portions joined, in effect, by a straight line, such data are notoriously difficult to rectify and to correlate.

Recent extensive studies have shown that the equation

$$\phi = \frac{x - x_1}{a + bx}$$

where

$$\phi = \log \left[\frac{20y}{\log(100 - y)} \right]$$

fits many data that result in both normal and skewed, elongated S-shaped curves and that the constants "a" and "b" can be determined graphically or analytically with ease through the use of Table I for the ϕ -function.

The use of the equation and the table of the ϕ -function is illustrated in the following example where the data are similar to, but not identical

with, those of a recent experimental investigation¹ and where "y" represents a cumulative percentage and "x" is a value that is proportional to particle size.

Plot the data as shown in Figure 1, choose x_1 (the value of x that corresponds to $y = 0.1$) as 50, and fill in the column in Table II that is headed "x - 50." In the ϕ -column enter values of ϕ read from Table I, compute values of $(x - 50)/\phi$ and enter them in the proper column. Plot $(x - 50)/\phi$ against x in Figure 1 and note that two straight lines, which intersect at $x = 100$, result. By the method of averages² determine the equations of these straight lines to be

$$\frac{(x - 50)}{\phi} = 0.10 + 0.2156x \quad x < 100$$

and

$$\frac{(x - 50)}{\phi} = 6.78 + 0.1489x \quad x > 100$$

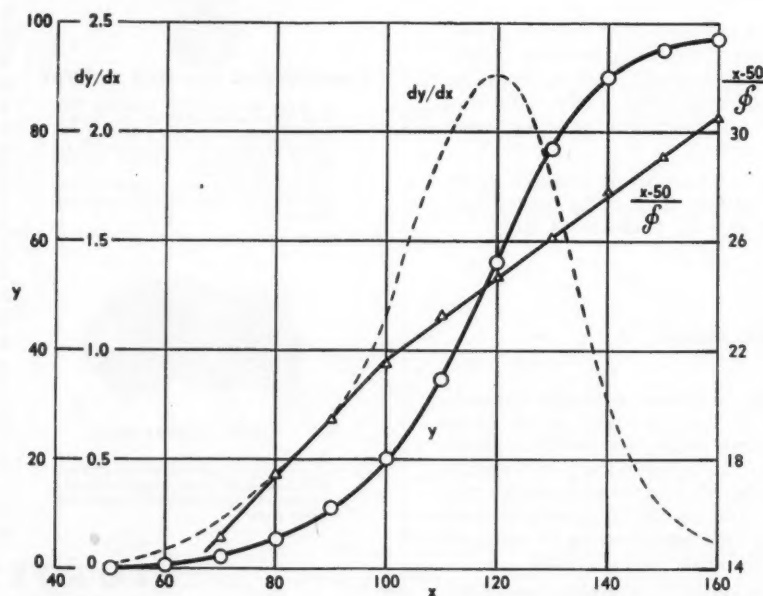


Figure 1

Data on self-aligning rotary joints

Four-page, two-color catalog includes specs and dimension data on line of self-aligning rotary joints for use on steam, air, oil, gas and water at temperatures from minus 100 to plus 500°F, and with pressures to 250 psi. Line includes sizes from 1/2 to 5" inclusive.

Cat 11 is issued by Rotherm Engineering Co., Inc., Dept. CP, 4911 Irving Park Rd., Chicago 41, Ill. When inquiring specify CP 5619, pages 2 and 3.

Shows foam system

Pocket size periodical treats several aspects of fire prevention and safety measures. Particular interest in the 14-page booklet is an article showing a foam protection system installed at a pumping station. "Firefax" is issued by Pyrene Mfg. Co., Dept. CP, 564 Belmont Ave., Newark 8, N. J. When inquiring specify CP 5620 on handy form, pages 2 and 3.

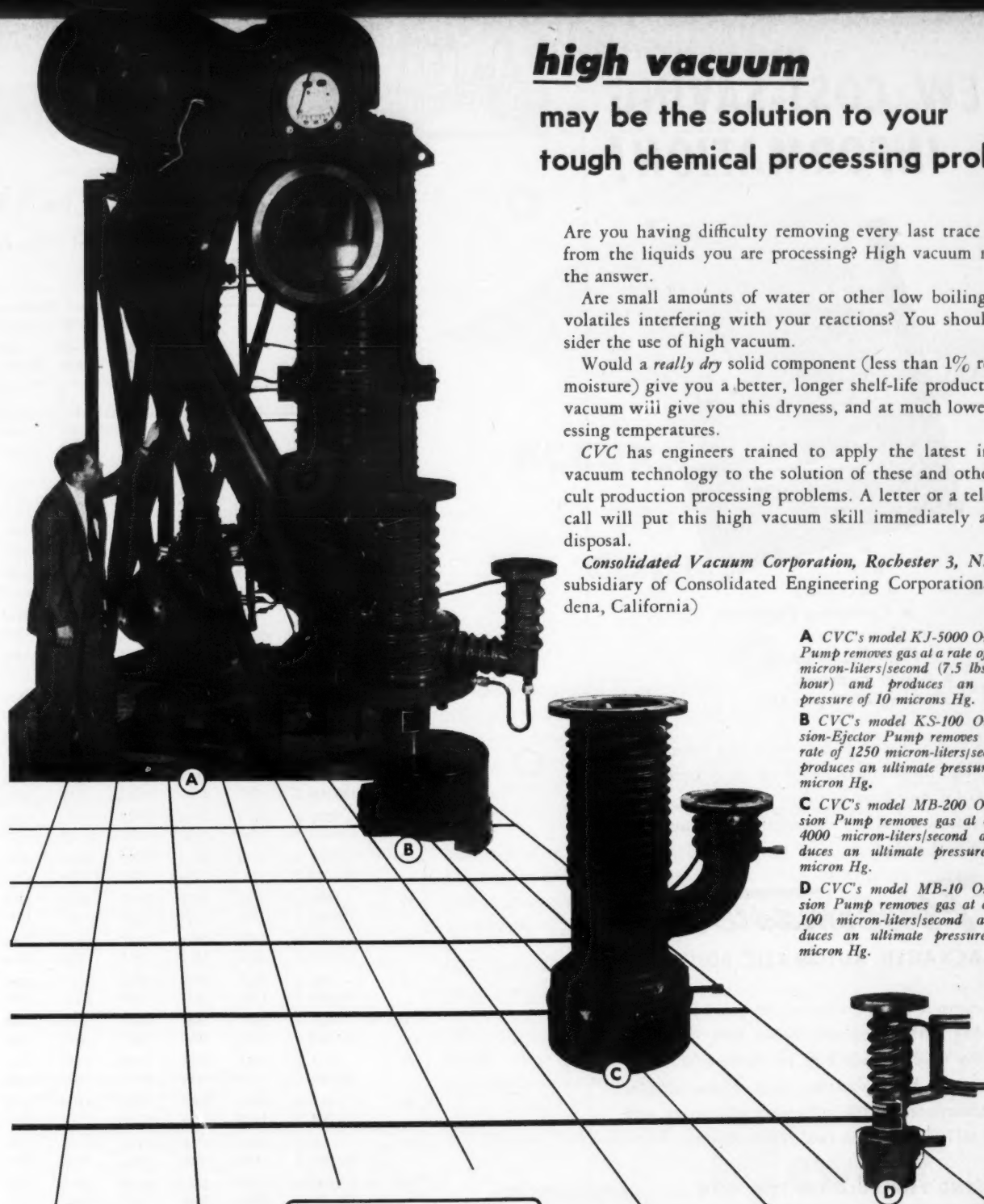
Questions-answers on plastic pipe

Two illustrated leaflets present factual, informative answers to twenty-two questions about company's line of flexible and rigid plastic pipe. Bulletins describe pipe, its recommended applications, and installation procedures.

Diameters and weights are listed for rigid pipe in sizes from 1/2 to 2 inches; and diameters, calculated bursting pressures, weights, and lengths are tabulated for flexible pipe in sizes from 1/2 to 6 inches.

"Answer Sheets" on plastic pipe are issued on letterhead request to Carlon Products Corp., Dept. CP, 10225 Meech Ave., Cleveland 5, Ohio.

For more information on product at right, specify CP 5621 ... see information request blank between pages 2 - 3.

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B CVC's model KS-100 Oil Diffusion-Ejector Pump removes gas at a rate of 1250 micron-liters/second and produces an ultimate pressure of 0.01 micron Hg.

C CVC's model MB-200 Oil Diffusion Pump removes gas at a rate of 4000 micron-liters/second and produces an ultimate pressure of 0.4 micron Hg.

D CVC's model MB-10 Oil Diffusion Pump removes gas at a rate of 100 micron-liters/second and produces an ultimate pressure of 0.1 micron Hg.

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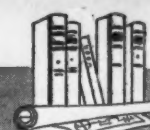
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Processing and Engineering Data



65b

A New Equation for S-Shaped Curves

TABLE I Value of 1000φ and 100,000 S

$$\phi = \log \left[\frac{y}{\log(100-y)} \right] + 1.301$$

$$S = 0.4343 \left[\frac{1}{y} + \frac{0.4343}{(100-y) \log(100-y)} \right]$$

y	0.1	0.2	0.3	0.4	0.5	0.6	0.7	0.8	0.9
1000 φ	0	301	477	602	699	779	845	904	955
100,000 S	434300	217100	144800	108700	86900	72500	62100	54400	48300

y	0.0	0.5	1.0	1.5	2.0	2.5	3.0	3.5	4.0	4.5
1000 φ		699	1001	1177	1303	1399	1480	1547	1606	1658
100,000 S		86900	43500	29000	21800	17500	14600	12500	11000	9740

y	1000 φ	100,000 S	1704	1746	1784	1819	1852	1883	1911	1938	1963	1987
5	1000 φ	100,000 S	8790	8000	7340	6780	6310	5890	5530	5210	4930	4680
10	1000 φ	100,000 S	2010	2032	2052	2072	2091	2109	2127	2144	2160	2177
	100,000 S		4450	4240	4060	3890	3730	3590	3450	3330	3210	3110
15	1000 φ	100,000 S	2191	2206	2221	2235	2248	2262	2274	2287	2299	2311
	100,000 S		3010	2920	2830	2750	2670	2600	2530	2470	2410	2350
20	1000 φ	100,000 S	2323	2334	2345	2356	2367	2377	2387	2397	2407	2416
	100,000 S		2300	2240	2190	2150	2110	2060	2020	1980	1940	1910
25	1000 φ	100,000 S	2426	2435	2444	2453	2462	2471	2479	2488	2496	2504
	100,000 S		1870	1840	1810	1780	1750	1720	1690	1670	1640	1620
30	1000 φ	100,000 S	2512	2520	2528	2536	2543	2551	2558	2565	2572	2580
	100,000 S		1590	1570	1550	1530	1510	1490	1470	1450	1430	1420
35	1000 φ	100,000 S	2587	2593	2601	2607	2614	2621	2628	2634	2640	2647
	100,000 S		1400	1385	1370	1354	1340	1326	1313	1300	1287	1275
40	1000 φ	100,000 S	2653	2659	2666	2672	2678	2684	2690	2696	2702	2708
	100,000 S		1262	1251	1240	1228	1218	1208	1198	1188	1180	1170
45	1000 φ	100,000 S	2713	2719	2725	2731	2736	2742	2748	2753	2758	2764
	100,000 S		1162	1153	1145	1138	1131	1123	1116	1109	1103	1096
50	1000 φ	100,000 S	2770	2775	2780	2786	2792	2797	2802	2807	2812	2818
	100,000 S		1090	1084	1079	1074	1069	1063	1059	1054	1052	1047
55	1000 φ	100,000 S	2823	2828	2833	2838	2843	2849	2854	2859	2864	2869
	100,000 S		1043	1039	1036	1033	1030	1027	1025	1023	1021	1019
60	1000 φ	100,000 S	2875	2879	2885	2890	2895	2900	2905	2910	2915	2920
	100,000 S		1018	1017	1015	1014	1014	1013	1013	1014	1015	1015
65	1000 φ	100,000 S	2925	2930	2935	2941	2945	2951	2956	2961	2966	2972
	100,000 S		1016	1018	1019	1022	1024	1026	1030	1033	1037	1041
70	1000 φ	100,000 S	2977	2982	2987	2992	2998	3003	3009	3014	3020	3025
	100,000 S		1045	1050	1057	1062	1069	1075	1083	1092	1099	1108
75	1000 φ	100,000 S	3031	3036	3042	3048	3053	3059	3065	3071	3078	3083
	100,000 S		1118	1130	1141	1153	1166	1180	1196	1213	1228	1248
80	1000 φ	100,000 S	3090	3096	3102	3109	3116	3123	3130	3137	3144	3152
	100,000 S		1267	1289	1313	1337	1367	1394	1425	1460	1496	1537
85	1000 φ	100,000 S	3160	3168	3176	3185	3193	3203	3212	3222	3233	3244
	100,000 S		1580	1628	1681	1738	1801	1870	1950	2037	2135	2245
90	1000 φ	100,000 S	3255	3267	3280	3294	3309	3325	3343	3362	3383	3407
	100,000 S		2369	2510	2672	2863	3081	3345	3654	4034	4503	5092

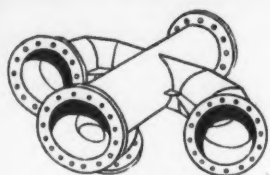
y	95.0	95.2	95.4	95.6	95.8	96.0	96.2	96.4	96.6	96.8
1000 φ	3435	3447	3459	3472	3488	3504	3521	3540	3560	3584
100,000 S	5850	6220	6640	7110	7660	8280	9000	9870	10870	12100

y	97.0	97.2	97.4	97.6	97.8	98.0	98.2	98.4	98.6	98.8
1000 φ	3609	3639	3672	3711	3757	3814	3886	3984	4130	4397
100,000 S	13610	15510	17910	21110	25490	31700	41700	58200	92700	198900

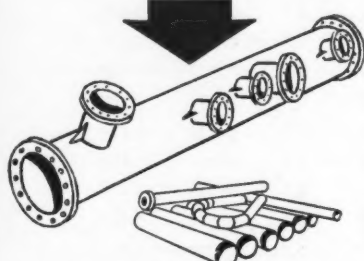
Chemical Processing — December, 1953

When inquiring check CP 5622 on handy form, pgs. 2-3

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on handy form, pgs. 2-3

NEW LITERATURE

Delivers constant current despite load

Illustrated data sheet explains operation and use of electronically regulated power supplies. It points out several features of unit which can supply constant current regardless of load in DC circuits where voltage does not usually exceed 150 v. "Constant Current Power Supplies" is issued by Associated Specialties Co., Dept. CP, 1751 Main St., Orefield, Pa. When inquiring reader may simply specify CP 5624 on handy form, pages 2 and 3.

High combustion efficiency offered by injector-type box burners

Having a wide variety of conversion or original equipment applications, this injector-type box burner works with equal efficiency on low, medium or high pressure gas, utilizing a natural draft. Eight-page bulletin gives specifications and dimensions for three general types of unit: standard, extended cage and open cage. A broad range of sizes and capacities is available to suit a variety of operating requirements.

Bul H-9 is available from Eclipse Fuel Engineering Co., Dept. CP, 1001 Buchanan St., Rockford, Ill. When inquiring specify CP 5625 on handy form, pages 2 and 3.

Pictures whole line of rotameters

Eight-page bulletin is printed in two colors. It pictures and explains features of a wide variety of rotameters and associated equipment. Industrial, laboratory, and kits of instruments are included. Specifications and tables of capacities permit quick selection of types. Bul 110a is issued by Brooks Rotameter Co., Dept. CP, Lansdale, Pa. When inquiring specify CP 5626 on handy form, pages 2 and 3.

Specifications & applications of rubber sealing ribbon

Technical data sheet covers weather-proof, water-tight, synthetic rubber fabric-reinforced sealing ribbons. Specifications, application methods, and test results are given, including applications as a gasketing material. Tabular data shows 13 sizes of ribbons from 1/4 to 2" wide and 1/32 and 1/16" thick in 100 and 200 ft rolls in which ribbon is currently available.

Bul EC-1202 is available from Minnesota Mining & Mfg. Co., Adhesives & Coatings Div., Dept. CP, 423 Piquette Ave., Detroit 2, Mich. When inquiring specify CP 5627 on handy form, pages 2 and 3.

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It follows that when you are screening material to get solids of a definite size, the accuracy of your end product depends on the accuracy of the mesh you use. If you think you are using a screen with 0.012" openings, when in reality you are using a screen with openings measuring 0.0185" (both of these openings are possible in 40 x 40 mesh cloth), the size of your product may not meet your process specifications.

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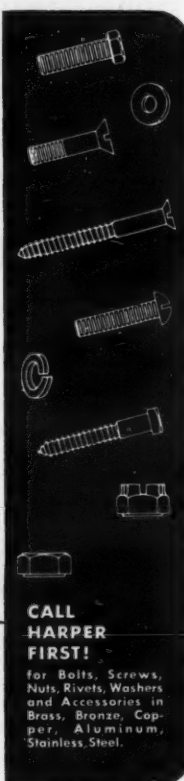
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Processing and Engineering Data



65c

A New Equation for S-Shaped Curves

TABLE II

y, obsd	x	φ	x-50	$\frac{x-50}{\phi}$	$\frac{x-50}{\phi}$ calc	φ calc	y calc	Devi- ation	S	dy/ dx
0.1	50				10.88	0.000	0.1	0.0	4.343	0.021
0.5	60				13.04	0.767	0.6	0.1	0.725	0.088
2.1	70	1.322	20	15.13	15.20	1.317	2.1	0.0	0.209	0.225
5.2	80	1.721	30	17.43	17.35	1.729	5.6	0.4	0.0787	0.459
11.0	90	2.052	40	19.49	19.50	2.051	11.0	0.0	0.0406	0.705
20.2	100	2.327	50	21.49	21.66	2.308	19.8	-0.4	0.0232	1.153*
34.6	110	2.581	60	23.25	23.14	2.591	35.3	0.7	0.0139	1.912
56.0	120	2.833	70	24.71	24.63	2.840	56.7	0.7	0.0103	2.270
77.0	130	3.053	80	26.20	26.13	3.060	77.6	0.6	0.0118	1.764
90.0	140	3.255	90	27.65	27.63	3.257	90.1	0.1	0.0240	0.775
95.0	150	3.435	100	29.11	29.11	3.435	95.0	0.0	0.0585	0.287
97.0	160	3.609	110	30.48	30.58	3.595	96.9	-0.1	0.1285	0.118

*Average of 1.000 and 1.306, the slopes of the straight lines.

From these equations find the calculated values of φ, enter them in the column headed "φ, calc.", and interpolate values of "y, calc." from Table I.

In some cases the chief reason for developing an empirical equation to fit data that yield elongated S-curves is so that one can differentiate to determine the slope of the curve at any desired point, thus obviating the uncertain slopes that would arise from graphical determination. For the equation

$$\phi = \log \left[\frac{20y}{\log(100-y)} \right] = \frac{x-x_1}{a+bx}$$

$$\frac{dy}{dx} = \frac{a+bx_1}{(a+bx)^2 S}$$

where

$$S = 0.4343 \left[\frac{1}{y} + \frac{0.4343}{(100-y) \log(100-y)} \right]$$

To facilitate differentiation, values of S are given in Table I. These are used in filling out the column headed S in Table II, the last column of which contains values of dy/dx which are plotted against x as the dotted curve in Figure 1.

Equations of the form of

$$\frac{xq+d}{1x-x} = \phi$$

have been found to fit a wide variety of normal and skewed, elongated S-shaped curves in a most satisfactory manner.

LITERATURE CITED

- (1) CHINAL, M. R. and LEVI, D. W., private communication, 1953.
- (2) DAVIS, D. S., *Empirical Equations and Nomography*, p 4, McGraw-Hill Book Co., Inc., New York, (1943)

Outlines instruments for 17 variables

Manufacturer's general instrument line for process control is set forth in 16-page bulletin. Published in two colors, it describes and pictures instruments for combustible, conductivity, draft, flow, liquid level, and other usually encountered quantities. Bul 17 is issued by Bailey Meter Co., Dept. CP, 1050 Ivanhoe Rd., Cleveland 10, Ohio. When inquiring specify CP 5631 on handy form, pages 2 and 3.

Safe handling, loading and unloading of SO₂

Sulfur dioxide, which is classified by the ICC as a non-flammable compressed gas, is the topic of a recently published safety data sheet. In this 16-page publication is found information about shipping containers and precautions to observe in unloading, loading and handling this material. Along with listing of important physical and chemical properties, data sheet recommends proper personal protective equipment to be worn and describes first aid measures. To obtain Data Sheet SD-52 remit 25c direct to Manufacturing Chemists' Association, 246 Woodward Bldg., Washington 5, D.C.

Design for flow control

Reprint of paper delivered at Instrumentation Conference delves into design of flow control systems for water, sewage and industrial waste treatment. It lists basic devices and methods used to achieve flow control, goes on to discuss types of systems including proportioning systems.

"Design of Flow Control Systems" is issued by CDC Control Services, Inc., Dept. CP, 400 S. Warminster Rd., Hatboro, Pa. When inquiring specify CP 5632 on handy form, pages 2 and 3.

Flaws located in metal parts in field or factory

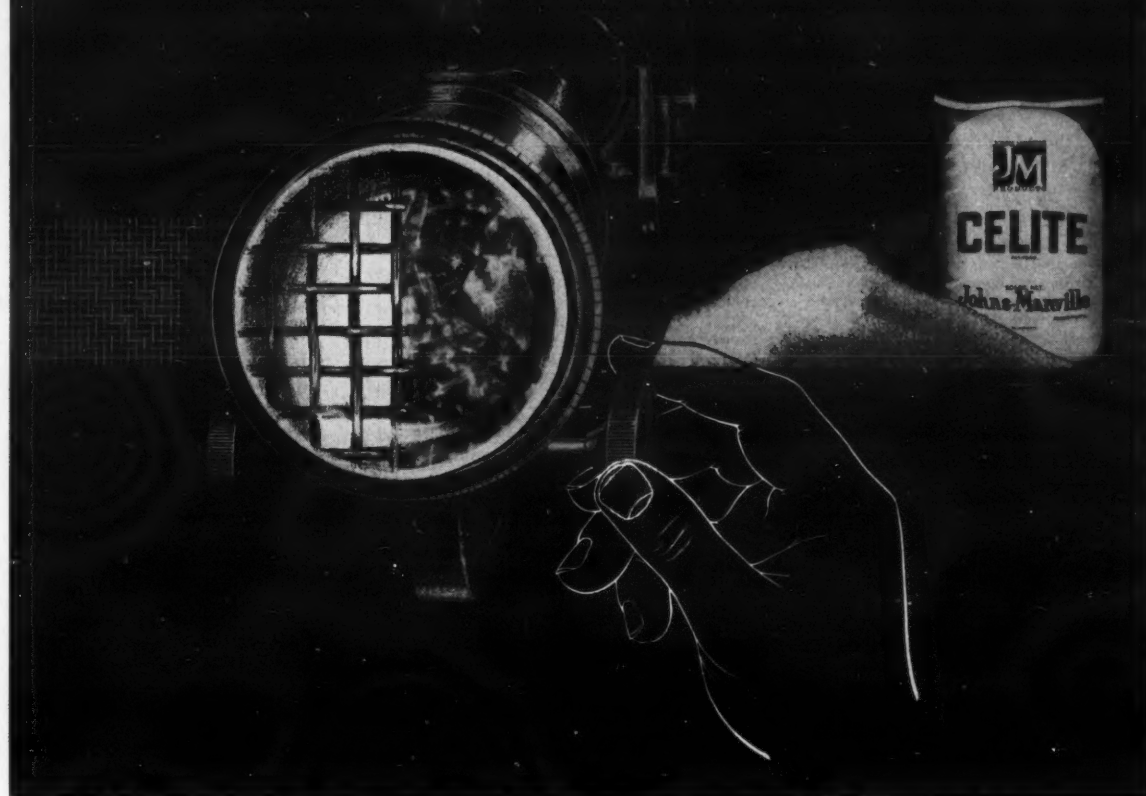
Ten-page, 2-color booklet outlines the many applications of two methods for discovering hidden flaws in metal parts. One method, called Dy-Chek, is portable for use in the field. The other, Chek-Spek, is for inspection on high speed production lines.

Both methods are thoroughly explained and photographs illustrate many applications. Complete directions for use are also included.

Booklet A-500 is available from Turco Products, Inc., Dept. CP, 6135 S. Central Ave., Los Angeles 1, Calif. When inquiring specify CP 5633 on handy form, pages 2 and 3.

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If you want to improve your present filtration system or find an economical way to utilize filtration in your processing, investigate the Celite method now. One of the Johns-Manville Celite Filtration Engineers will gladly discuss your problem. These men are backed by complete technical services and the Johns-Manville Research Center, largest laboratory of its kind in the world. For further information write Johns-Manville, Box 60, New York 16, N. Y. In Canada, 199 Bay Street, Toronto 1, Ontario.

*Celite is Johns-Manville's registered Trade Mark for its diatomaceous silica products.

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TROY Angular MIXERS

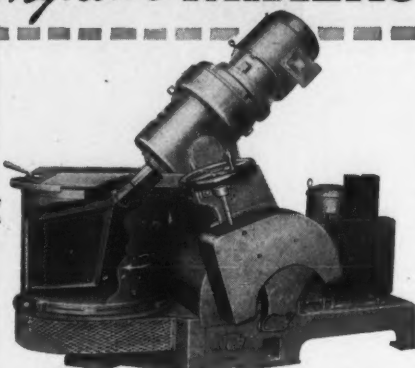
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Efficient

the mixer that provides a unique multi-directional mixing action; agitator arms sweep the side and the bottom tending to turn the material in while raising it; at the same time it folds the material in at the top from side to center.

Our Bulletin GR-51 gives full details of the TROY Angular Mixers. Send for your copy.



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Process Machinery Division



Established 1870

TROY ENGINE & MACHINE CO.

TROY, PENNSYLVANIA, U.S.A.

When inquiring check CP 5635 on handy form, pgs. 2-3

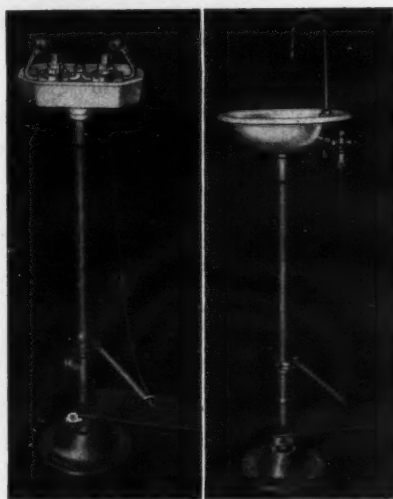
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When inquiring check CP 5636 on handy form, pgs. 2-3

NEW LITERATURE

How and why of high vacuum applications detailed

Factual data on planning the high vacuum system; connections and speed of evacuation; selection of high vacuum pumping systems; low pressure technique; plus illustrations and descriptions of various types of high vacuum pumps are presented in 60-page bulletin. Charts and tables are numerous and large section is devoted to gages and accessory equipment.

Bul 10F is available on letterhead request to Central Scientific Co., Dept. CP, 1700 Irving Park Rd., Chicago 13, Ill.

Chemical industry's accident rate outlined by Safety Council

Booklet of 27 pages summarizes injury experience of chemical industry for 1952. Figures are based primarily on accident records of members of Council but also include records of non-member companies which report voluntarily. Records for safety, frequency rate tables, severity rates, comparison of different branches' records, and other facts and figures are included.

Bul "Accident Rates, 1952-Chemical Industry" is available to Council members for 35 cents at National Safety Council, Dept. CP, 425 N. Michigan Ave., Chicago, Ill. For non-members price is 70 cents a copy.

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Several data sheets contained in a brochure are descriptive of a high dispersible oil that penetrates quickly to base metal on exposed or tightly closed surfaces such as joints, and utilizes rust (iron oxide) to form a protective coating which is said to offer an excellent foundation for paint. Material also stops rust action on steel without necessity of removing rust, serves as a reinforcing additive for practically all air-drying oil type maintenance paints and is a vehicle for aluminum paste or powder.

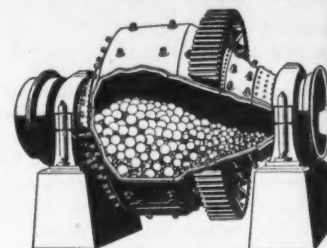
Brochure on Penetrol is issued on letterhead request to The Flood Co., Dept. CP, Hudson, Ohio.

Shows 37 instruments

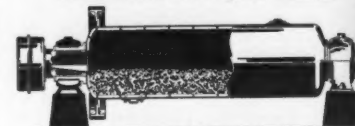
Published in 2 colors, 34-page publication describes 37 different instruments. These are designed for electrical measurements, physical measurements, resistance-welding measurements, textile measurements, ultrasonic energy applications, and many others.

"Instruments for Modern Measurements" is issued on letterhead request to Sales Promotion Dept., Brush Electronics Co., Dept. CP, 3405 Perkins Ave., Cleveland 14, O.

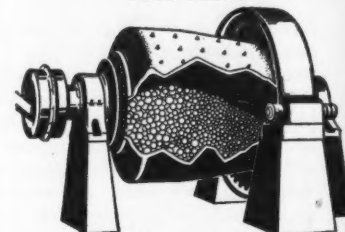
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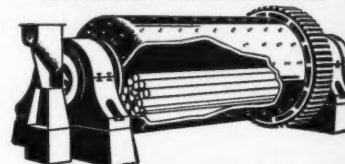
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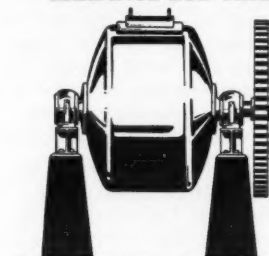
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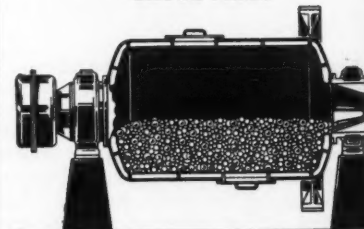
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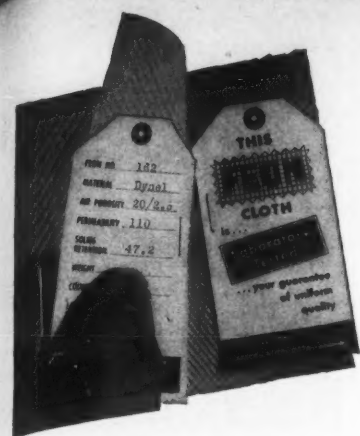
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Convention & Exhibit Schedule 1953

Nov. 30-Dec. 5. 24th Exposition of Chemical Industries, Commercial Museum & Convention Hall, Philadelphia, Pa.

Dec. 1-4. National Association of Corrosion Engineers, Central Oklahoma Section, Corrosion Conference, University of Oklahoma, Norman, Oklahoma.

Dec. 10-12. American Chemical Society, Regional Conclave, Jung Hotel, New Orleans, La.

Dec. 13-16. American Institute of Chemical Engineers, Annual Meeting, St. Louis, Mo.

Dec. 29. American Association for the Advancement of Science, Annual Meeting, Bradford Hotel, Boston, Massachusetts.

1954

Jan. 19. Commercial Chemical Development Association, Winter Meeting (closed), Hotel Statler, St. Louis, Missouri.

Jan. 25-28. Plant Maintenance & Engineering Show, International Amphitheater, Chicago, Ill.

Jan. 26-28. Association of American Soap & Glycerine Producers, Inc., 27th Annual Industry Convention, Waldorf-Astoria Hotel, New York City, New York.

Jan. 27-29. Society of Plastics Engineers, 10th Annual Technical Conference, Royal York Hotel, Toronto, Ontario.

Jan. 27-29. American Management Association, Conference on Marketing, Hotel Roosevelt, New York City, New York.

Mar. 8-10. American Institute of Chemical Engineers, Washington, D.C.

Mar. 15-19. National Association of Corrosion Engineers, 1954 Conference and Exhibition, Kansas City, Missouri.

Mar. 17-18. Commercial Chemical Development Association, Annual Open Meeting, Hotel Statler, New York City, New York.

Mar. 24-Apr. 1. American Chemical Society, 125th national meeting, Kansas City, Missouri.

Apr. 5-8. American Management Association, 23rd National Packaging Exposition, Auditorium, Atlantic City, New Jersey.

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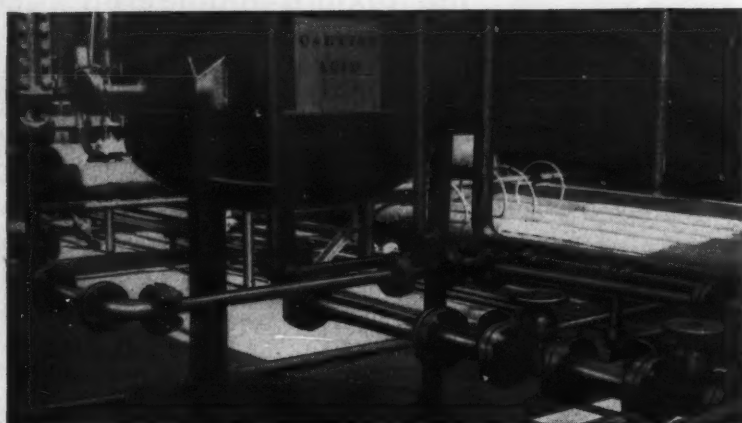
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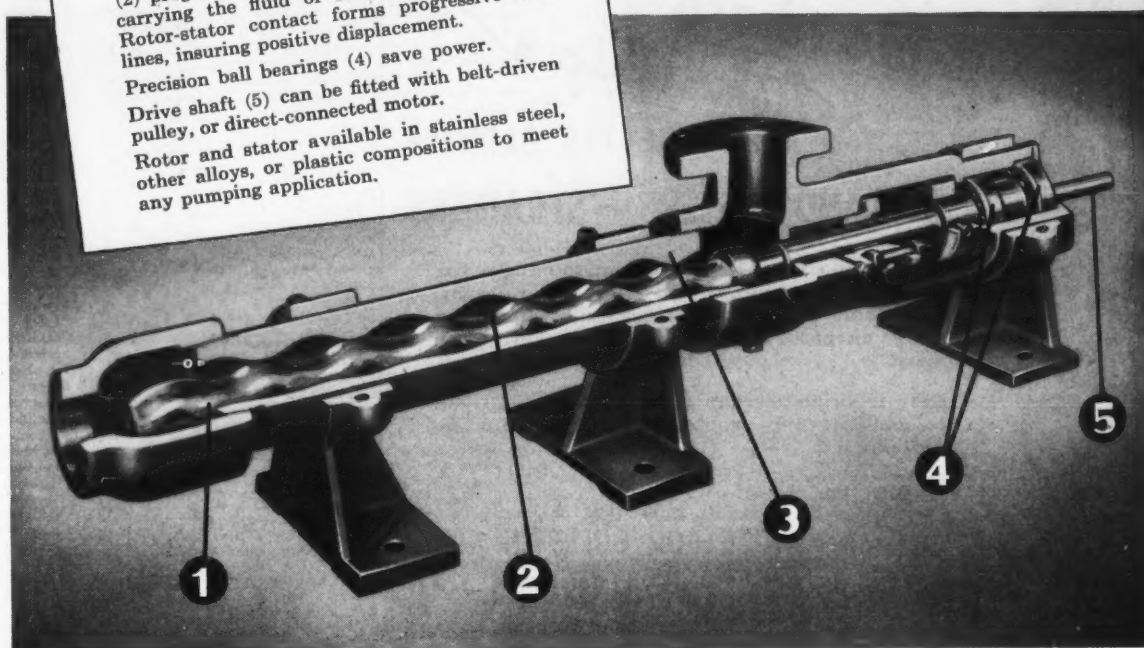
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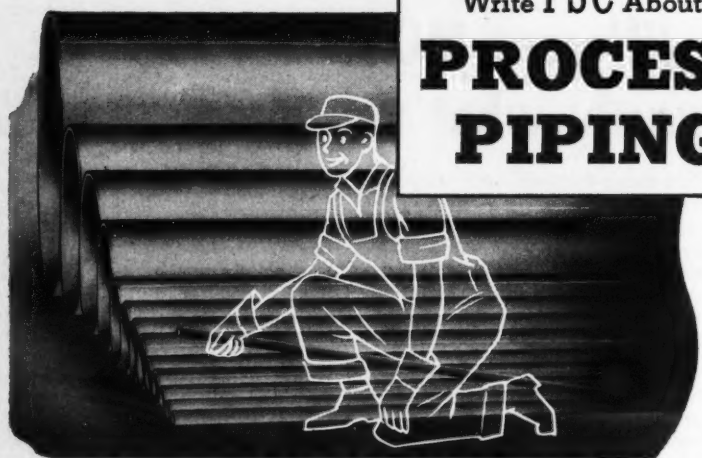
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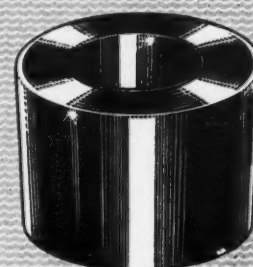
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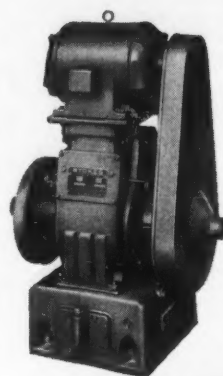
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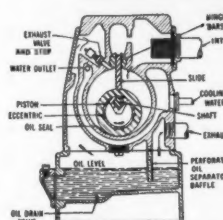
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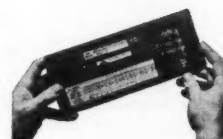
At left is the new Model G Stokes High Vacuum Pump. Basically, and in outward appearance, the new model is the same simple, efficient, compact and reliable unit as its widely used predecessor, Model F. Five major engineering improvements are incorporated in the new model: 1) a new mechanical face-seal minimizes routine maintenance and reduces to a minimum the possibility of oil leakage at the shaft; 2) new exhaust valve-stops permit use of these pumps in an exceptionally broad range of applications, including rapid cycling evacuation of large-volume systems; 3) a new intake screen filter prevents damage by dirt, scale, and other solids sometimes present in the system; 4) a new oil filter in the line to the shaft seal affords special protection to the bearings at these points; 5) a new solenoid valve in the oil supply line automatically prevents oil-flooding of the pump in the event of power failure.



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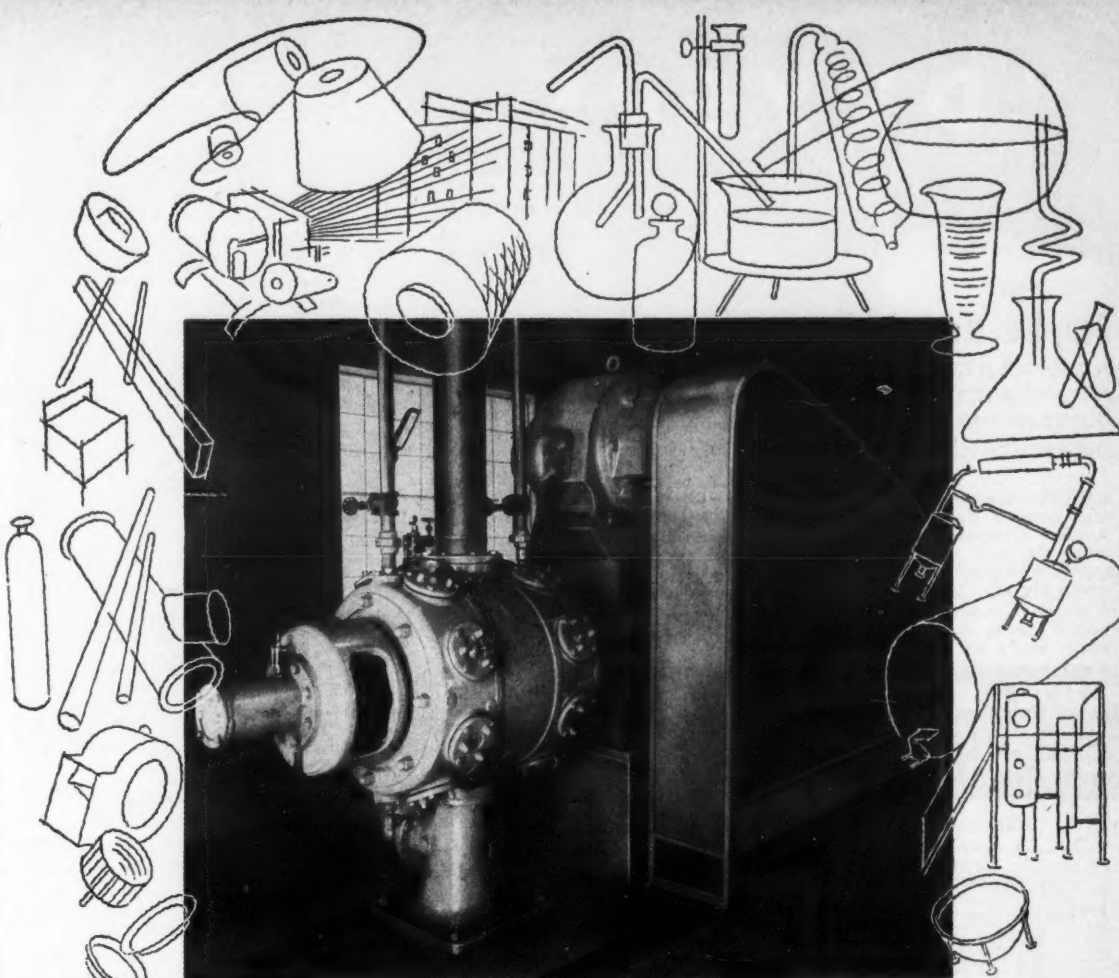
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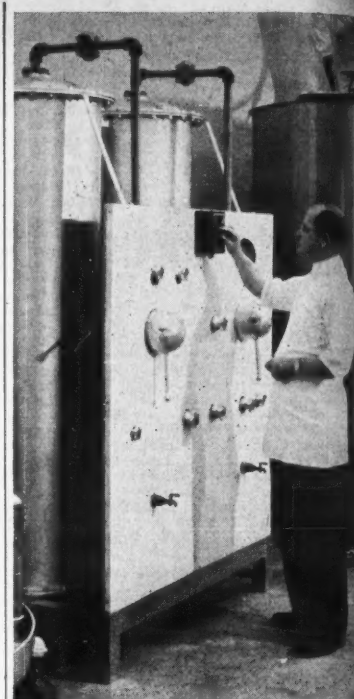
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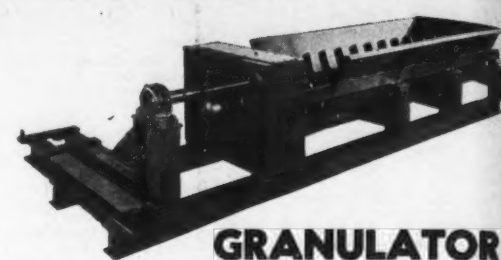
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Alluring paint

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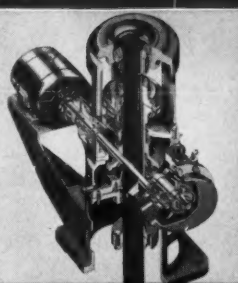
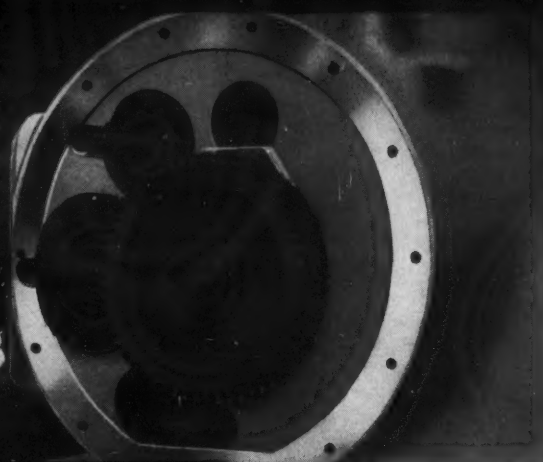
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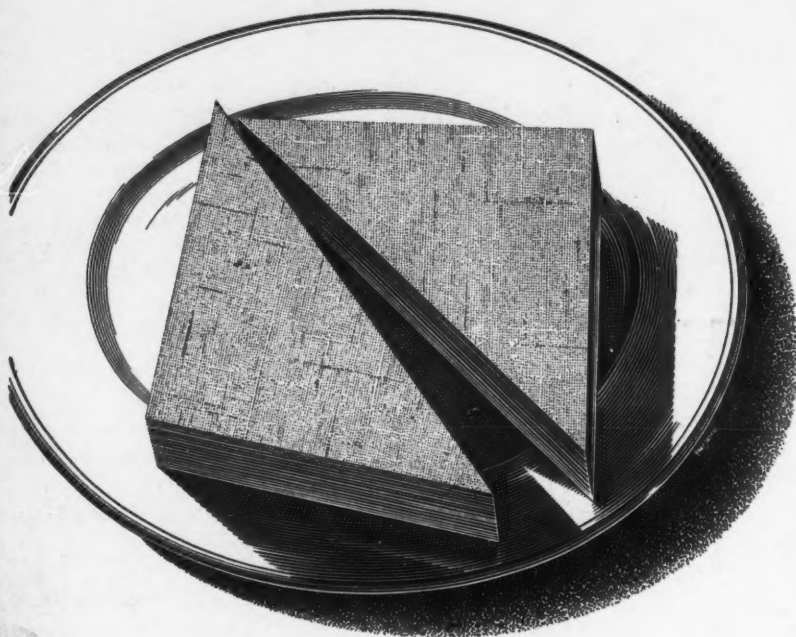
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